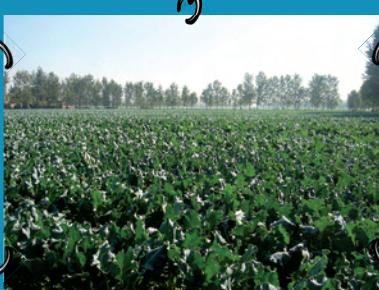


# The role of *guanxi* in buyer-seller relationships in China

A survey of vegetable supply chains in Jiangsu Province

Hualiang Lu



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**Hualiang Lu**

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Dit onderzoek is uitgevoerd binnen de onderzoekschool  
Mansholt Graduate School of Social Sciences.

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Proefschrift  
ter verkrijging van de graad van doctor  
op gezag van de rector magnificus  
van Wageningen Universiteit,  
Prof. dr. M.J. Kropff,  
in het openbaar te verdedigen  
op maandag 4 juni 2007  
des namiddags te vier uur in de Aula

Lu, Hualiang (2007), The role of *guanxi* in buyer-seller relationships in China: a survey of vegetable supply chains in Jiangsu Province

Ph.D. Thesis, Wageningen University - with references - with summaries in English and Dutch

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ISBN: 978-90-8504-665-3

ISBN: 978-90-8686-038-8

Dedicated to my wife Shuyi



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# Acknowledgements

Throughout my study in Wageningen for the last four years, I have received valuable direct and indirect support from numerous people. Without their help, this book would not have been accomplished.

I gratefully acknowledge the Netherlands Foundation for the Advancement of Tropical Research (WOTRO) for providing financial support for conducting this research.

My sincere gratitude goes to my supervisors for offering me a place in the WOTRO project. Prof. Dr. Onno Omta, I appreciate your guidance on the structure of the book. Your detailed comments on academic writing improved the quality of the book. Dr. Jacques Trienekens, I thank you for your immeasurable day to day support. You kept your office door open whenever I wanted to talk to you. Both of your knowledge and experience will be beneficial for my academic career, thank you!

My special thanks go to Prof. Dr. Ruerd Ruben for his continuous support. Ruerd, you financed and supervised my M.Sc. thesis, taught me how to write and present scientific papers, and assisted in getting our works published. I am also grateful to Dr. Douwe-Frits Broens, you provided detailed comments on my research proposal and guided me how to construct the model.

I acknowledge the contribution and encouragement from my colleagues in the WOTRO project. Dr. Aad van Tilburg, Prof. Dr. Olaf van Kooten, Dr. Ruud Verkerk, and Prof. Dr. ir. Tiny van Boekel, you provided valuable comments on my work during various project workshops and meetings. Emma and Zuniga, I am happy to meet you in Wageningen as my best friends. I enjoyed our shared discussions, trips, tea and coffee, and traditional dinners. Wishing you all the best!

I want to express my special gratitude to Dr. Erno Kuiper for supervising my M.Sc. thesis, reading some of my work, offering suggestions for improvement, and always welcoming my questions. I would like to thank Dr. Ron Kemp, Dr. Alison Burrell and Dr. ir. Koos Gardebroek for their assistance in solving my doubts in econometrics. I am also grateful to Derk-Jan for translating my English summary into Dutch.

Working at the Management Studies Group of Wageningen University has been an enjoyable and unforgettable experience. Thank you, my colleagues and friends – Anna, Andre, Danny, Derk-Jan, Emiel, Frances, Geoffrey, Guangqian, Hans, Harry, Janneke, Jiqin, Joanna, Jos, Jose-Jaime, Lilly, Leonie, Maarten, Mark, Paul, Peter, Ron, Victor, Wijnand, Willeke, and Wim – for your valuable support in one way or another. I enjoyed our academic and cultural

discussions, coffee breaks and monthly drinks, group lunches and dinners, group trips, sailing, and skating during the past years.

Part of my research took place in China. I would like to thank Dr. Nico Heerink, Prof. Dr. Funing Zhong and Prof. Dr. Dinghuan Hu for their academic support. I am grateful to Feng Yajun, Li Yousheng, Pan Changsheng, Fu Mingxin, Jiang Jinquan, Chu Fuyun, Fei Guihua, Huang Ting, Shi Yandi, Wang Wei, Wang Cheng, Song Chenlin, Chen Zhengru, Li Li, Wang Li, Jiang Zhongjian, Den Ancun, Luo Yunlu, Jia Lei, Yan Jingkui, Qin Yuying, Yang Siqui, Sheng Xinrong, Wu Rufang, Lu Zhixin, Sun Maojiang, and many others, for their help in finding and contacting my interviewees. I also appreciate the time and effort of Chen Jian, Xu Yingshou, He Yanwen, Jin Bizhong, Sun Zhiming, Xu Lin, Wu Yulong, Zhang Fencheng, Lu Guihua, Xie Zhilai and all the companies and farmers that I interviewed.

I gratefully acknowledge the LEB fund for contributing to the participation in international conferences and the publication of this book. Thanks also go to Audrey Cournoyer for editing the English language.

Six years study at Wageningen University has made Wageningen my second home. My sincere appreciation goes to Fucai, Fuyi, Xiuli, and their big family for their friendship and hospitality. Special gratitude goes to my friends in Wageningen, Huaidong Du, Lan Ge, Qi Jing, Yuan Li, Jiayou Zhong, Jia Liu, Shuman Wang, Huashu Wang, Xiaoping Shi, Zhongxin Guo, Xianlei Ma and others for helping me in various ways and for the happy time we had together.

Last, but not least, I thank my family, especially my parents and parents in law for their unconditional support and encouragement in pursuing my study. My most special thanks go to my wife Shuyi Feng. You encouraged and inspired me to pursue the highest academic degree and supported me throughout my study. You witnessed and shared all the frustration and happiness during the course of my study. Thank you for your love, support, patience, and understanding!

Hualiang Lu

Wageningen, May 2007

# Chapter I Introduction

The objective of this study is to analyse governance mechanisms that support market performance in Chinese vegetable supply chains. We investigated the contractual and relational governance in a supply chain framework to show how they contribute to market performance. The specific contribution of this study is its focus on chain governance in a fast-emerging turbulent market, providing opportunities to review the role of relational governance for supplying quality vegetables corresponding to the consumers' preferences.

Using an integrated research framework incorporating theoretical insights from supply chain management, transaction cost economics and social capital, the present study explains buyer-seller relationships in Chinese vegetable supply chains and investigates the most effective approach to achieve market performance for different chain participants.

This book is part of an integrated project titled 'Globalisation, Food Quality and Sustainable International Agri-Business Chains: Chain Integration in Fish, Vegetables and Tropical Fruit in Kenya, China and Costa Rica'.<sup>1</sup> The overall objective of this project is to develop a generic framework for the design and management of internationally integrated agri-food chains so as to improve chain oriented quality control and sustainable resource management.

This chapter starts with the introduction of the research background regarding China's economic development in the context of economic transition in general and in the vegetable sector in particular. Section 1.2 addresses the major problems we are going to tackle and the research questions we want to answer. Section 1.3 provides the theoretical framework, followed by the discussion of research methodology in Section 1.4 and theoretical contribution in Section 1.5. In Section 1.6 we discuss the practical relevance of this study. This chapter ends with an outline of this book.

## 1.1 Research background

### 1.1.1 China's economic development

The sheer size of China's economy, its rapid growth and its increasing integration into the global economy will make China a crucial player in the world market for agricultural products. With a total population of 1.3 billion, China is the largest transition economy in the world. Contrary to some expectations, China has hitherto succeeded in feeding its more than 20 percent of world population with its less than ten percent of world arable land. The

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<sup>1</sup> We acknowledge the financial support from the Netherlands Foundation for the Advancement of Tropical Research (WOTRO), file number: W01.65.2001.010.

performance of China's agriculture is impressive in light of a growing population and high income growth rate (Van Tongeren and Huang, 2004).

Since the economic reforms initiated in 1978, China has emerged as an increasingly prosperous country. The annual growth rate of real GDP was on average 9.4% from 1979 to 2004. China's economic reforms started from agricultural sector. During the period of 1979-1984, agriculture was the driving force of economic growth, showing an average annual growth rate of 7.1% (Feng, 2006). Even though the relative importance of agriculture in China's economy has decreased, agriculture still contributed 15.2% to overall GDP and employed 46.6% of the total labour force in 2004 (National Bureau of Statistics of China, 2005a).

Rural economic growth over the last two decades has been attributed to a number of important underlying factors, and some of these factors are likely to contribute to further economic growth. The first is the switch from collective farming to the Household Responsibility System (HRS)<sup>2</sup>, which linked farm households' income closely with their performance, and brought about a rapid growth of agricultural productivity in 1979-1984 (McMillan *et al.*, 1989; Fan, 1991; Lin, 1992).

The second is the liberalisation of agri-food marketing (McMillan *et al.*, 1989; Huang *et al.*, 1999). Marketing reform started after the release of central control over agri-food circulation. The wholesale markets and wet markets took over the position of the state-owned companies, which were the only players before liberalisation. Private traders and wholesalers soon played active roles in distributing agri-products. Structural adjustment made it possible for resources to shift from low productivity areas to high productivity areas. Coherent to this shift, many farmers shifted to produce high-value crops (e.g. fruit and vegetables) and make decisions increasingly on the basis of market-oriented principles (Sonntag *et al.*, 2005). Emerging domestic markets (i.e., processors and supermarkets) and international markets provided incentives to farmers throughout the nation, and the output of farmers is delivered to consumers across ever-widening national and international markets. Rising food export demonstrates that Chinese farmers can now compete in the international markets.

The third is technological improvement, such as improved irrigation system, integrated pest management and the adoption of new seeds, which further increased agricultural productivity (Fan, 1991; Huang and Rozelle, 1996; Fan and Pardey, 1997; Nyberg and Rozelle, 1999). China has by far the most sophisticated agricultural biotechnology programme in the developing world. Indeed, many of its breakthroughs are of global importance (Van Tongeren

---

<sup>2</sup> The main objective of the Household Responsibility System (HRS) is to distribute the farmland equally to all farm households based on labour availability. Farm households only need to provide certain quota (mainly grain and wheat) to the state; the leftover yield belongs to the farm household. The farm household income coming from agricultural production is closely related to the effort and the performance of agricultural production. The HRS has stimulated the farmers' agricultural production and enhanced agricultural productivity and food security in China.

and Huang, 2004; Sonntag *et al.*, 2005). China is one of the first countries to introduce a genetically modified (GM) crop commercially and currently has the fifth largest GM crop area, after the USA, Argentina, Brazil, and Canada (James, 2005).

The fourth is off-farm employment and rural industrialisation. Rising agricultural productivity reduced the demand for labour in agriculture, providing a strong incentive for rural labourers to shift to off-farm employment. Rural industrialisation is characterised by the rapid development of Township and Village Enterprises (TVEs), which offered an effective solution to absorb surplus labour from agriculture (Nyberg and Rozelle, 1999). In 2004, TVEs absorbed 135.7 million rural labourers (18.2% of the total labour force, or 27.8% of rural labour force, National Bureau of Statistics of China, 2005a). The development of TVEs, however, was not sufficient to fully employ the surplus labour from agriculture. More and more labourers are migrated to work in private enterprises in the coastal regions.

Rural economic growth has been an important engine for China's economic growth, which have changed the face of rural China, and stimulated a dramatic increase in rural incomes and a reduction in rural poverty (Feng, 2006). In 2005, farmers' per capita net income was 406.9 USD, six times more than in 1978 (National Bureau of Statistics of China, 2006). The number of rural poor has reduced from 250 million in 1978 to 26.1 million in 2004<sup>3</sup> (National Bureau of Statistics of China, 2005b). In percentage terms this amounts to a drop in rural poor from more than 30% to less than 3%. China has gradually started the transition from a poor rural economy towards a modern industrial society.

Rapid economic growth and urbanisation in China has brought about profound changes in the demand for food in China. There has been a strong trend away from traditional diets that are heavily oriented towards starchy staples. In particular, there has been a shift towards more varied diets with increasing quantities of animal products, fruit and vegetables, vegetable oils and dairy products but decreasing quantities of grains. Furthermore, according to the FAO food balance sheets, with income increase, aggregate food intake in terms of calories per capita has been increasing as well, and food consumption (especially vegetable consumption) per capita in China is also high in comparison to other Asian countries, such as Japan, Thailand, Indonesia, and India (ABARE, 2006). Consumer concerns are moving away from getting enough food to food quality and safety. This shift requires the offer of high-quality and sanitary agri-food to the market, which leads to a great challenge to the agricultural production and marketing system in China. Food quality has to do with freshness of the product, diversity, high hygiene standards, low chemical residuals, etc.

However, many of the conditions that facilitated earlier fast rural economic growth are no longer effective. The institutional reforms (particularly the HRS) only provided a one-time

<sup>3</sup> These figures are based on China's official poverty line, which was 83.5 USD (1USD = 8 RMB) per capita per year in 2004. Based on the World Bank definition of poverty (income of 1 USD per day), the number of people living in poverty in rural China was 88 million in 2002 (National Bureau of Statistics of China, 2005b).

incentive (Nyberg and Rozelle, 1999). The intensity of the use of modern inputs, such as fertilisers (280 kg/ha), pesticides and herbicides, is already one of the highest in the world (OECD, 2005a). The development of TVEs has been constrained by growing competitive pressures and financial difficulties since the mid-1990s (OECD, 2005b). Agricultural productivity<sup>4</sup> and rural industrial growth have slowed dramatically in recent years. Rural labour transfer requires new solutions, and growth of rural incomes is experiencing major bottlenecks in China. Increasing demand for high-quality and sanitary foods requires further action in agri-food production and marketing. Developing internationally oriented economy evokes the contradictions between small-scale farmers and big markets.

Future increases in agricultural productivity and rural incomes and an improvement in food quality are likely to depend on the diversification of agricultural production into labour-intensive and high-value commodities, such as fruit and vegetables (Nyberg and Rozelle, 1999; Van Tongeren and Huang, 2004), and the promotion of more efficient agri-food markets, such as the improvement of agricultural infrastructure, information transparency and the emergence of new partnerships with rural residences (Sonntag *et al.*, 2005).

### **1.1.2 China's vegetable sector**

Growing vegetables has proved to be a feasible way to improve agricultural productivity, raise farmers' incomes and absorb agricultural surplus labour in rural areas. China claims to be the most important vegetable producer in the world. In 2003, it supplied about 36.5% of the world's total vegetable production (FAO, 2004b)<sup>5</sup>. The vegetable-sown area of vegetables had reached 17.7 million hectares in 2005, accounting for 11.4% of total cultivated area in China. Vegetable production in 2005 reached 564.5 million tons, with an annual growth rate of 6.4% for the last decade (National Bureau of Statistics of China, 2006). Vegetable sector is very important in Chinese national economy. Vegetable is the second largest crop in China after cereals. Vegetable production value accounts for more than 30% of the total agricultural production value. Vegetable production is therefore an important source of income - especially cash income - for farmers. About 16% of farmers' per capita net income came from vegetable production in 2000 (Liu *et al.*, 2004). Vegetable production employed about 78 million rural labourers, and a further 80 million were employed in vegetable processing and marketing (Liu *et al.*, 2004).

The development of Chinese vegetable sector not only focused on domestic markets, but also aimed at the expansion into international markets. China is one of the top five vegetable exporters in the world. The accession of China into the World Trade Organisation (WTO) in 2001 further strengthened China's vegetable position and export prospects, since China has

<sup>4</sup> Grain production has increased greatly since 2004 due to the implementation of a series of policies (subsidy for grain production and agricultural tax elimination) aimed at directly promoting grain production and raising farmers' incomes.

<sup>5</sup> The FAOSTAT data include fruit as well.

a clear competitive advantage for labour-intensive vegetable production (Huang and Chen, 1999). According to the statistics of China Customs, China's vegetable export in 2000 reached 3.14 million tons<sup>6</sup>, with an export value of 2.0 billion USD. In 2005, the volume and value of vegetable export increased to 5.2 million tons and 3.3 billion USD respectively (National Bureau of Statistics of China, 2006).

Although China's vegetable sector experienced rapid growth and occupies a significant share in domestic and international markets, the vegetable sector still faces several problems. First, the enlargement of production scale leads to over-supply of low-quality vegetables to markets. This surplus has to be sold for dump prices, which consequently leads to the investment problems in vegetable production as well as in marketing. Second, vegetable quality and safety become the major constraints for the further development of the Chinese vegetable sector. The high quality standards (certified with Green Food and Organic Food quality standards) prove to be difficult to be implemented by smallholders due to technical, managerial and financial constraints. Thus high-quality vegetables only account for a very small portion of total vegetable production. Third, only a small portion of China's vegetables (about 1% of total vegetable output) is exported, and the market share of new forms of domestic outlets (e.g. supermarkets) is also rather small. Vegetables that sold in high-value market outlets (i.e., processing companies, supermarkets and international markets) mostly come from selected production areas and organised producers. In other words, most of vegetable smallholders are excluded from the modern high-value market outlets. Further enlargement of exports depends on the increasing implementation of high quality and sanitary standards in vegetable production. Fourth, although China has been very successful in increasing its share in world exports, it remains a low-cost exporter in a relatively low-quality segment of international markets and struggles to meet international requirements for food safety. The competitiveness of Chinese vegetables is largely based on low prices, while the quality and sanitary perspectives are the major constraints (Liu *et al.*, 2004).

To solve the problems faced by the Chinese vegetable sector, the integration between production and marketing may give the right direction towards a possible solution. Recently, attention is focused on the principles of supply chain management (SCM) in the agri-food sector in China. SCM requires information sharing and collaboration between producers, traders, processors, retailers and other actors involved in the entire chain. Furthermore, researchers and policy makers recognised that farmer specialised cooperatives or associations can foster buyer-seller relationships between smallholders and vegetable buyers, which will inevitably improve market performance of the vegetable sector in China. Information sharing using internet and communications increases the fulfilment of supply and demand requirements (quality, quantity and delivery conditions). Trust, commitment and cooperation become the key determinants to enhance buyer-seller relationships, and ultimately, improve supply chain performance (Claro, 2004). The growth of vegetable processing industries increases

<sup>6</sup> Export vegetables include fresh, frozen and dried vegetables.

the added value of vegetable chains and improves the income for smallholders and the other chain participants. However, the participation of smallholders in modern high-value vegetable markets requires improved quality standards, rising awareness of the importance of food safety and increased collaboration (World Bank, 1996, 2006).

## **1.2 Problem statement and research questions**

Although the management and co-ordination of agri-food supply chain has become increasingly important for cost reduction and maximising market opportunities, supply chain management is a new concept for agribusiness sector in China. With a long experience in vegetable production, the vegetable sector in China performs in a traditional way. Wet markets and wholesale markets are still the most convenient outlets for most smallholders. Vegetable supply chains in China are rather simple and with limited added value. More than 70% of the vegetables are distributed through the routine of **producers** → **wholesale markets** → **wet markets** → **consumers**. Only less than one-third of the added value is gained by vegetable producers. Although supermarkets appear to be a better alternative for vegetable distribution in developed countries and in transition countries like China, the market share for vegetables in supermarkets is still limited (Hu *et al.*, 2004; Reardon and Timmer, 2005). Only few vegetable producers are able to comply with high quality standards, strict delivery conditions and stable supply requirements and deliver their vegetables to supermarkets.

Nowadays, vegetable transactions are still largely based on arm's length relationships with cash payment in the traditional outlets in China. However, preferred buyer-seller relationships and long-term transaction partnerships are emerging both in newly developed domestic markets and in international markets. Vegetable farmers and traders are increasingly realising the importance of long-term buyer-seller relationships for their success in vegetable business. The integration of smallholders in high-value outlets, such as supermarkets and international markets, requires not only stable supply and the upgrade of quality and safety standards, but also, more importantly, preferred buyer-seller relationships for the economies of scale and mutual benefits (Boselie *et al.*, 2003; Ruben *et al.*, 2007a). Improved organisations (specialised associations, cooperatives and other organisational forms) increase smallholders' ability to improve efficiency in production and marketing and to negotiate for better prices. Better organisation is a base for the integration of small-scale farmers into coordinated supply chains that provide access to export markets and the rapidly growing modern domestic retail markets by permitting them to enjoy a portion of the margin (World Bank, 1996, 2006).

The objective of this study is to identify the best governance mechanisms to support market performance in Chinese vegetable supply chains. We investigate the current situation of Chinese vegetable supply chains in a national and international context to identify the means and methods to improve vegetable supply chain performance. We study both formal (contracts) and informal (relationship) governance mechanisms in a supply chain framework in Jiangsu Province, P.R. China. We explore critical elements of buyer-seller relationships

and quantitatively investigate the effects of buyer-seller relationships on chain performance. By applying supply chain management concepts, we want to improve the effectiveness and efficiency of vegetable supply chains in China. To fulfil this objective, this study addresses the following central research question:

*What is the best way to organise vegetable supply chains taking into account the fast socio-economic developments in China?*

In order to answer this central research question, we examine Chinese vegetable sector based on personal interviews with two key groups of participants in vegetable supply chains: vegetable producers (farmers) and buyers (processing companies, exporting companies and supermarkets)<sup>7</sup>. In China, buyer-seller relationships are facilitated by personal relationships, which are traditionally called *guanxi*<sup>8</sup>. In a Confucian society like China, *guanxi* prevails in social life and business society. People rely on *guanxi* to seek valuable information, receive assistance and facilitate business transactions. *Guanxi* functions as informal governance in China, which promotes interpersonal trust, encourages trust-based transactions, moderates investment decision, and enhances business performance. Therefore, the objective of this study is also to understand how *guanxi* is built, how it influences the integration of buyer-seller relationships and ultimately, market performance.

We define the concept of *guanxi* networks based on social capital theory to explain buyer-seller relationships in the Chinese vegetable sector. In present study, buyer-seller relationships include three concepts: interpersonal trust, transactions specific investments and contractual governance. Our focus is on the explanation of the effects of *guanxi* networks on these three concepts. We expect sellers and buyers to acquire valuable support from *guanxi* networks in which they are embedded and benefit from their ability to develop and maintain long-term buyer-seller relationships. If marketing information and technical, managerial and financial supports obtained from *guanxi* networks can enhance buyer-seller relationships, ultimately, they will enhance the chain actors' market performance. An integrated research framework is developed taking into account the interactions among *guanxi* networks, buyer-seller relationships (interpersonal trust, transaction specific investments and contractual governance) and chain actors' market performance. The following two research questions will be answered in this study:

---

<sup>7</sup> In this study, producers refer to small-scale farmers. Particularly, in a buyer-seller relationship, if the seller is vegetable producer, then the buyer refers to processor, exporter or supermarket; if the seller is processor, exporter or supermarket, then the buyer refers to customer or final consumer.

<sup>8</sup> *Guanxi* refers to personal relationships or connections in China. It is composed of two Chinese characters, *guan* (gate) and *xi* (connection). One must pass the gate to get connected to networks (Wang, 2005). A detailed discussion of *guanxi* networks is provided in Section 3.4. Interested readers please refer to Fan (2002) and Wong and Leung (2001) for a deeper understanding.

1. Do *guanxi* networks improve the integration of buyer-seller relationships and ultimately, market performance in vegetable supply chains in China?

2. Is there any difference in the use and the effect of *guanxi* networks in upstream and downstream buyer-seller relationships and traditional and modern high-value market outlets?

### **1.3 Theoretical framework**

Based on the analysis of the development of vegetable chains in China, we recognise the growing importance of buyer-seller relationships and of building long-term business partnerships in vegetable supply chains. We expect that with the development of international markets and the rise of supermarkets in China, vegetable distribution system will reform to use preferred suppliers and build close relationships between buyers and sellers (Boselie *et al.*, 2003; Hu *et al.*, 2004; Ruben *et al.*, 2007a).

In this study, we use the same model for different samples: the farmer sample (vegetable producers) and the buyer sample (processing companies, exporting companies and supermarkets). We explore how the support from *guanxi* networks affects buyer-seller relationships, focusing on transaction specific investments, interpersonal trust and contractual governance. We also investigate how buyer-seller relationships influence chain actors' market performance. We measure market performance in two steps. The first step is to examine how buyer-seller relationships improve the ability to comply with channel requirements regarding product quality and delivery conditions; and the second step is to analyse how the compliance with channel quality and delivery requirements influences market performance. Figure 1.1 illustrates the conceptual research model.

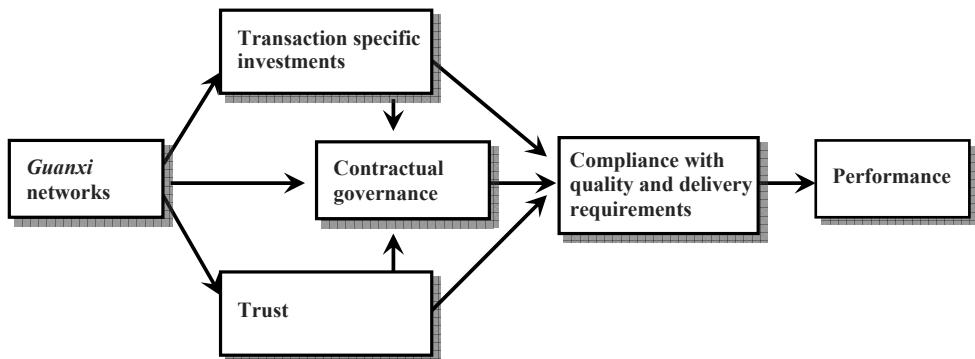


Figure 1.1. Conceptual research model.

## 1.4 Research methodology

We conduct this research in Jiangsu Province, P.R. China. The selection of Jiangsu Province is motivated by several considerations. First, with a total population of 67 million, Jiangsu makes a great economic contribution to China. Jiangsu is not only one of the developed economic zones, but also one of the most important vegetable production and export provinces in China. For the last decade, Jiangsu has been among the top five provinces in terms of per capita income in China. The vegetable-sown area ranked fourth and the output ranked third out of the 31 Provinces in China (National Bureau of Statistics of China, 2006). Second, vegetable production in Jiangsu Province is now shifting away from the expansion of production scale to the upgrade of quality, specialisation and the increase of added value for the entire supply chain. Doing research in this area will benefit not only vegetable producers, but also other participants in the chain, such as processors, exporters and retailers. Third, a good knowledge base provides technical and institutional support. Nanjing Agricultural University and Jiangsu Academy of Agricultural Sciences are two famous institutions in China. The research carried out in these institutions may support my study in one way or another.

The empirical study is conducted in two conductive steps: qualitative case studies followed by quantitative analysis. We interviewed eight companies (one vegetable production company, two processing companies, two export companies, one cooperative, and two supermarkets) in different areas (developed and less developed economic zones) in Jiangsu Province. The case studies enabled us to verify the operationalisation of the constructs in measuring concepts, provided insights for the assessment of the content validity of the constructs and improved the formation of good questions for questionnaire survey. Case studies allowed us to get a deep understanding of the interactions among *guanxi* networks, buyer-seller relationships and market performance. Based on the source and destination of vegetables, we identified nine most important buyer-seller relationships. We also investigated the role of governance arrangements in achieving performance for vegetable sellers and buyers.

Questionnaire survey can be regarded as a supplement and extension of case studies. Data collection is also conducted with personal interviews. Personal interviews are able to overcome the limitations of other methods in data collection (e.g. telephone interview and mailing questionnaires) in China, such as less educated interviewees, poor access to internet and telephones, etc. We interview both sides of the buyer-seller relationship. In total 167 farmers and 84 buyers (processing companies, exporting companies and supermarkets) are interviewed. Due to difficulties in reaching identical buyer and seller in a buyer-seller relationship, we pooled all observations to analyse buyer-seller relationships. Three specific relationships (farmers in relationships with their buyers, buyers in relationships with vegetable suppliers, and buyers in relationships with their customers and final consumers) are finally analysed with structural equation models (see Chapter 7 for details).

## **1.5 Theoretical contribution**

The conceptual research model contributes to supply chain management, social capital theory and transaction cost economics. This study proposes to combine these theories to explain buyer-seller relationships. The supportive effects of *guanxi* networks on buyer-seller relationships imply that the theoretical framework developed in this study underlies various theories. The business environment creates a positive climate for sellers and buyers to be embedded in networks of social, professional and exchange relationships with other organisations and actors (Granovetter, 1985; Jarillo, 1988; Gulati, 1998). *Guanxi* networks are valuable because they permit the cross-checking of facts. In this sense, buyer-seller relationships can be enhanced by the safeguarding and coordination effects of *guanxi* networks. *Guanxi* networks also improve market performance, directly and indirectly, which demonstrates the necessity to study the effects of *guanxi* in business and in social life.

By studying the effects of *guanxi* networks on buyer-seller relationships in China, we extend the application of relationship marketing theory and relational governance to transition economies. *Guanxi* is widely recognised as relational governance and relationship marketing within the Chinese context (Arias, 1998; Wong and Chan, 1999; Wong and Leung, 2001; Wang, 2007). *Guanxi*, as a special form of relational governance, contributes to building long-term relationships and safeguarding opportunism in vegetable supply chains. This is coherent with the application of relationship marketing in the western world. However, *guanxi* also contributes to the short-term business relationships in China. *Guanxi* increases the flexibility for sellers and buyers in business practices. *Guanxi* makes it possible for sellers and buyers to diversify their markets in the short-term. *Guanxi* gives sellers and buyers rich opportunities to shift from one market to another or from one partner to another. The short-term effects of *guanxi* networks extend the application of relationship marketing theory and relational governance in supply chain management from a time perspective.

This research also contributes to the existing literature by considering both sides of a buyer-seller relationship. In order to gather empirical evidence, this study focuses on the two sides of the buyer-seller relationships. This allows for a fine-tuning of field research on the relationships, while most previous studies focused only on one side of the relationship, either sellers or buyers (Claro, 2004). By collecting data from both sellers and buyers, we accurately explore the differences between the purchasing and selling perspectives.

## **1.6 Practical relevance**

Theoretical and empirical findings to the research questions should benefit all participants involved in vegetable supply chains as well as policy makers.

The vegetable sector in China is well known for its huge production, increasing international orientation and the prominent role played by small-scale producers and buyers. Achieving

business success in long-term buyer-seller relationships is essential for both sellers and buyers. Understanding why and how some business relationships succeed while others fail is among the central questions faced by sellers and buyers. Studying *guanxi* networks and buyer-seller relationships to show the critical elements and the best approaches to achieve market performance will significantly benefit both sellers and buyers in business practices.

The experience and knowledge to design successful vegetable supply chains in Jiangsu Province will benefit the less developed areas in China. To respond to the increasing national and international requirements regarding quality and safety, vegetable production in Jiangsu Province is not simply aimed at expanding production scale and increasing vegetable outputs. More importantly, it focuses on quality upgrading, specialisation, industrialisation and internationalisation. Successful experience and better ways of organising vegetable supply chains will benefit the vast part of China, where vegetable sectors are still less developed or less successful in new market environments.

Government authorities are mainly concerned about national economic growth, transferring rural labour surplus and raising farmers' incomes. By investigating *guanxi* networks and preferred buyer-seller relationships, this research is able to point out the proper governance mechanisms for vegetable supply chains, which will substantially improve the overall performance for the vegetable sector. This offers significant practical relevance to policy makers. One of the most important policy implications is how to improve the organisational level of Chinese vegetable sector. Researchers revealed that organisations can facilitate smallholders to access to high-value markets (Hu *et al.*, 2004; Shen *et al.*, 2005). Farmers can improve their negotiation power to achieve high profits in situations of good organisation (World Bank, 2001). Specialised farmer associations can act as intermediary organisations to resolve the issue of efficient aggregation of products over many small-scale farmers. The supervision by specialised farmer associations in implementing high food quality and safety standards will be crucial to help farmers enter relations with supermarkets and international markets. Besides cooperatives, farmer-volunteered or government-initiated farmers' professional associations should be developed with great effort.

## **1.7 Outline of this book**

This book is divided to three parts: theory, design and results. Figure 1.2 depicts the structure of the book and the related research activities.

The first part is theory, including three chapters. Chapter 1 introduces the research background and discusses the research objective and the main research questions addressed in this study. Chapter 2 provides an overview of the study domain. The focus is given on the discussion of the development of vegetable production and marketing in China. Chapter 3 reviews a number of theories, such as supply chain management, social capital theory and transaction cost economics, to explain the buyer-seller relationships from an economic, organisational

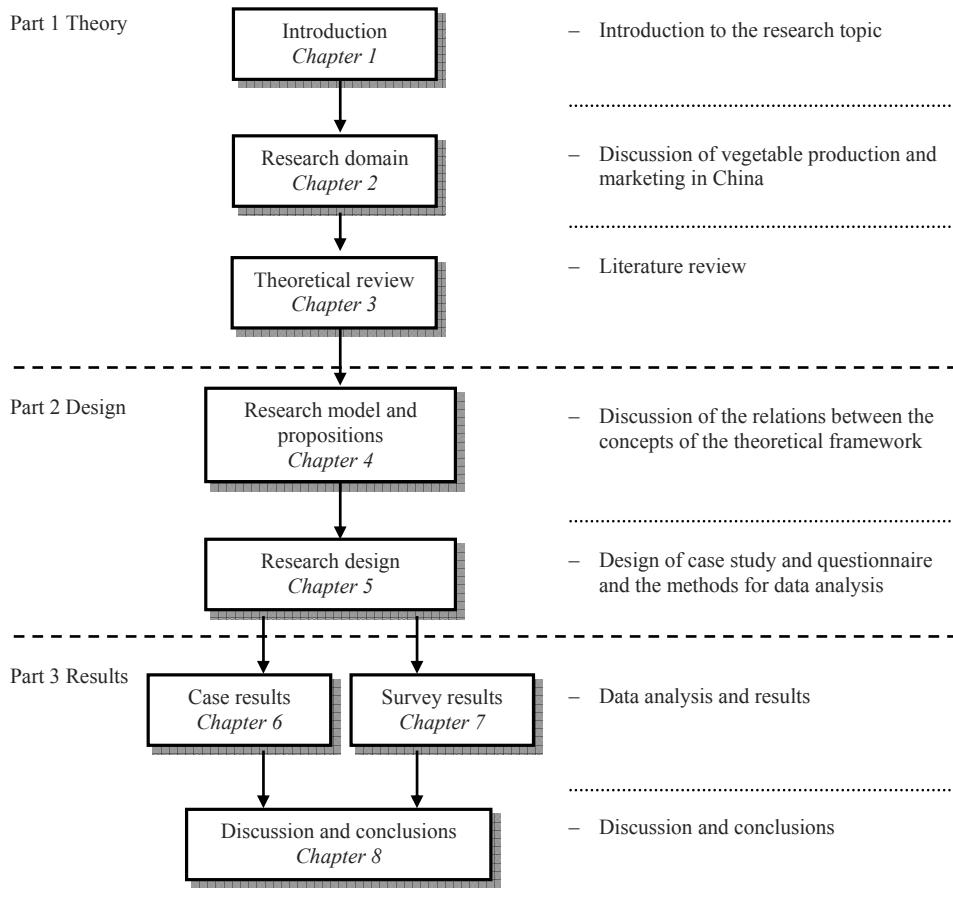


Figure 1.2. Structure of the book.

and social perspective. The Chinese culturally embedded concept of *guanxi* networks and the linkages between *guanxi* networks and the above mentioned theories are examined. The indicators for measuring the performance for buyer-seller relationships are also discussed.

The second part contains research design, including two chapters. In Chapter 4, buyer-seller relationships in vegetable supply chains are discussed and the research model is developed. Thereafter, several propositions are defined regarding the interrelations among the concepts of *guanxi* networks, buyer-seller relationships and market performance based on the research model. Chapter 5 presents the two conductive steps of the research design. Study population, the design of case study and questionnaire survey and the operationalisation of the research are

discussed. Data analysis methodologies, such as structural equation modelling, multinomial and binary logit model, are elaborated.

The last part of this book contains research results, including three chapters. Chapter 6 reports the insights gained from the interviews with eight vegetable companies. We focus on the focal buyer-seller relationships to show the interrelations between *guanxi* networks, buyer-seller relationships and market performance. Based on the case studies, we argue the need to investigate both sides of buyer-seller relationships in an integrated framework. In Chapter 7, we first analyse the validity and reliability of the constructs that are derived from the elements of the theoretical framework. We then provide the structural equation model to test the propositions for both sides of a buyer-seller relationship. We further investigate the factors determining marketing channel choice using binary and multinomial logit models. Chapter 8 discusses the main findings and puts the findings of this study into the policy and managerial perspectives. Additionally, the contributions and limitations of this study are highlighted.



# Chapter 2 Research domain

This chapter provides an overall picture of vegetable production and marketing in China in general and in Jiangsu Province in particular. Section 2.1 starts with the discussion of the development of vegetable production and marketing in China. The discussion is focused on vegetable production scale, region and variety structure, export, production method, and cultivation technology. Section 2.2 introduces the structure of vegetable markets in China. Three segments are distinguished: traditional local markets, emerging modern domestic markets and international markets. Section 2.3 provides an overview of the three vegetable quality and safety standards (Pollution-Free Food, Green Food, and Organic Food) in China. Section 2.4 provides a general introduction of vegetable production and marketing in Jiangsu Province. An overview of the distribution of added value in vegetable supply chains is also discussed. This chapter ends with some concluding remarks.

## 2.1 **The evolution of vegetable production and marketing in China**

### 2.1.1 The development of the Chinese vegetable sector

For a better understanding of the current situation of vegetable production and marketing in China, we review the development of the Chinese vegetable sector for the last several decades from the perspectives of vegetable production and supply, circulation policy and pricing policy. Like the entire economy, the vegetable sector in China also experienced the transition from a highly planned system to a market system. Generally, the development of the vegetable sector in China can be characterised into four different periods (Xiao, 1999; Tan and Xin, 2001).

*1. The central planning period (before 1977).* At that time, agriculture was the foundation of the Chinese economy. Vegetables production and marketing were fully planned and controlled by the government. Central and local governments made detailed plans for vegetable production including the sown area, varieties, etc., and were fully responsible for vegetable supply and distribution. Farmers produced vegetables collectively, based on government plans. Vegetable prices were fixed by the government and vegetables were only sold through state-owned vegetable companies. Due to the shortage of logistics and transportation support, vegetables were produced around the city and supplied to nearby areas. At the end of 1978, the vegetable-sown area was 3.3 million ha, accounting for 2.2% of the total crop-sown area. Vegetable markets were poorly developed.

*2. The economic reform period (1978-1984).* Since 1978, economic reforms started to change the Chinese economy. A significant change for farmers was the implementation of the Household Responsibility System (HRS). The HRS improved agricultural productivity dramatically.

Central government started to release part of the control over vegetable production and marketing. However, about 70% of vegetables were still under the control of the government. Vegetable purchasing prices were also increased, which largely stimulated vegetable production. Farmers had some freedom to produce and sell vegetables through alternative markets. Wet markets and wholesale markets were built up. In 1980, there were a total of about 40,800 wet markets in China with a total turnover of 13.9 billion USD, in which vegetables accounted for about 5% of the total turnover (0.7 billions USD, see Table 2.1). New vegetable varieties were introduced and new production technologies were implemented (e.g. greenhouse, disease control). As a result, vegetable production was expanded and vegetable quality was improved. At the end of 1984, the vegetable-sown area had reached 4.3 million ha, accounting for 2.8% of total crop-sown area.

*3. The fast development period (1985-1998).* The government has started to liberalise vegetable production and marketing since 1985. With the elimination of the planning system, vegetable production and marketing started to perform based on market mechanisms. Consequently, the government has changed its role from a major player to a manager in vegetable production and marketing. However, this change took place step by step and differed across the country. Vegetable production increased dramatically. Private traders and wholesalers emerged and soon replaced the state-owned vegetable companies. The Chinese central government has launched several programmes with respect to vegetable quality and safety in this period to encourage the further development of vegetable production and marketing. The Vegetable Basket Project (VBP) and the related Mayor's Responsibility System were the most important policies, which directly stimulated the growth of China's vegetable sector. In the first stage of the VBP (1988-1994), the objective of this project was to overcome the shortage of vegetable supply in China. At that time, the priority of the government was to increase vegetable supply to meet consumers' demand. This led to the release of price control on vegetables, providing farmers more freedom to grow vegetables. The Mayor's Responsibility System was an important institutional arrangement to guarantee the success of the VBP. In China, each municipality appointed a vice mayor to coordinate the VBP. The vice mayor held full responsibility for vegetable production and supply in that city. The second stage of the VBP focused more on enriching vegetable varieties (1995-2001) and improving vegetable quality and safety standards (since 2001). To supplement the VBP, the Action Plan for Pollution-Free Agricultural Products and Green Food Programme were launched by the Ministry of Agriculture. Both programmes focused on upgrading vegetable quality and safety, which will be further discussed in Section 2.3.

Since the late 1990s, many places in rural China have increased the area devoted to vegetable production in response to agricultural structural adjustments (the allocation of more farmland for cash crop cultivation and less for grain production). The number of vegetable varieties increased dramatically. At the end of 1998, the vegetable-sown area in China had reached 12.3 million ha, accounting for 7.9% of total crop-sown area. Market development also achieved

a big progress. There were about 89,100 wet markets in 1998, doubled since 1980. The total turnover of the wet markets was about 238.9 billion USD, 17 times more than in 1980. The vegetable turnover reached 26.6 billion USD, accounting for 11.1% of the total turnover at the wet markets (Table 2.1). More than 4,200 wholesale markets were set up with a total turnover of 34.6 billion USD.

*4. The industrialisation period (after 1998).* Due to the surplus of food supply and the decrease of crop prices, Chinese government encouraged farm households to implement new crop production structures in order to improve farmers' incomes. One significant adjustment was to shift from low-value crops (grains) to high-value crops (fruit and vegetables). Many efforts were also devoted to the development of vegetable processing industry. As a result, specialised vegetable production areas are emerging and the vegetable processing and exporting industry is booming. Vegetable production, storage, processing, and circulation are industrialised in many places. Meanwhile, vegetable markets also moved from seller markets to buyer markets due to the rapid growth of vegetable supply. At the end of 2005, there were about 69,500 wet markets in China. The total turnover of the wet markets was 319.2 billion USD in 2003. The

Table 2.1. The development of the wet markets and wholesale markets in China.

Year	Number of the wet markets		Total turnover at the wet markets (billions USD)*		Number of the wholesale markets	Total turnover of the wholesale markets (billions USD)
	Urban	Rural	All products	Vegetables		
1980	2,919	37,890	13.9	0.7	--	--
<b>1985</b>	<b>8,013</b>	<b>53,324</b>	<b>21.8</b>	<b>1.0</b>	--	--
1990	13,106	59,473	45.2	5.0	1,340	2.4
1995	19,892	63,000	137.9	14.5	3,517	16.9
<b>1998</b>	<b>24,127</b>	<b>65,050</b>	<b>238.9</b>	<b>26.6</b>	<b>4,243</b>	<b>34.6</b>
2000	26,395	62,416	292.6	32.1	4,532	40.4
2001	26,699	59,755	300.6	32.4	4,351	41.2
2002	26,529	55,969	313.0	34.8	--	--
2003	27,006	54,011	319.2	36.7	--	--
2004	25,404	46,148	--	--	--	--
2005	25,905	43,615	--	--	--	--

\* Total turnover is calculated based on the exchange rate of the related years.

The bold numbers indicate the related end year of each period.

Sources: China Statistical Yearbook, various issues; Tan and Xin (2001).

vegetable turnover achieved 36.7 billion USD, accounting for 11.5% of the total turnover (see Table 2.1). The wholesale markets also sustained great development; 4,351 wholesale markets were set up with a total turnover of 41.2 billion USD at the end of 2001. The wet markets and wholesale markets also increased in scale. In 2005, there were more than 3,300 commodity markets (including the wet markets and wholesale markets) with a turnover above 10 million USD in China. The total turnover of these markets reached 375 billion USD (National Bureau of Statistics of China, 2006). On average, the yearly turnover of each market was more than 110 million USD.

### **2.1.2 Vegetable-sown area and output**

Vegetables are among the most important food items in people's daily diet. People obtain essential nutrients from vegetables, which are not available in other food. The Chinese saying '*Man can have no meat for three days, but cannot have no green (vegetables) for one day*' indicates the importance of vegetables for human well-being. Based on China's statistical data, in 2003, rural and urban households spent approximately 29% of their total income on food, of which, more than half (17%) is spent on vegetables. According to FAO, China has one of the highest vegetable consumption rates in the world. Per capita vegetable consumption increased dramatically from 148.1 kg in 1995 to 254.1 kg in 2002 (FAO, 2004a). The important position of vegetables in people's daily life is also demonstrated by the fast development of the vegetable sector in China.

As already mentioned, in 2005, the cultivated area for vegetables was 17.7 million ha in China. Vegetable production had reached 564.5 million tons and per capita access to vegetables was more than 431.7 kg (see Table 2.2). Compared to 2000, the sown area increased by 16.4%, vegetable production increased by 33.1%, and per capita availability increased by 29.1%. Table 2.2 also shows the growth of vegetable production scale in China. In 2000, vegetable-sown area accounted for about 9.8% of the total crop-sown area. At the end of 2005, 11.4% of the total crop-sown area was used for vegetable production.

### **2.1.3 Vegetable variety structure**

There are in total about 140 vegetable varieties currently cultivated in China, in which 110 are common varieties. The yield of each of the top 20 vegetable varieties exceeds 10 million tons. China has achieved great success in the development of new vegetable varieties. China has developed and popularised 1000 vegetable breeds since the 1980s, in which good breeds make up 80% of the total breeds. China also imported a lot of new vegetable varieties and high-quality seeds from various countries, which further enlarged vegetable varieties.

The seven most popular vegetable varieties in China are Chinese cabbage, radish, cucumber, Chinese onion, tomato, eggplant, and pepper (see Table 2.3). The output of the seven major

Table 2.2. Vegetable production in China (1978-2005).

Year	Sown area (million ha)	% of vegetable- sown area in total crop-sown area (%)	Vegetable production (million tons)	Per capita availability (kg)
1978	3.3	2.2	--	--
1985	4.3	2.8	--	--
1990	6.3	4.3	--	--
1995	9.5	6.4	--	--
1998	12.3	7.9	--	--
2000	15.2	9.8	455.9	360.2
2001	16.3	10.5	483.4	378.8
2002	17.4	11.2	529.1	411.9
2003	18.0	11.8	540.3	418.1
2004	17.6	11.4	550.7	423.7
2005	17.7	11.4	564.5	431.7
Annual growth rate for the last 5 years	3.1%	--	5.9%	3.7%

Source: China Statistical Yearbook, various issues.

Table 2.3. Variety structure of vegetable production in China (%).

Year	Chinese cabbage	Radish	Cucumber	Chinese onion	Tomato	Eggplant	Pepper	Others	Total
1995	24.1	10.5	8.1	3.4	10.9	5.1	5.6	32.3	100
1996	21.6	9.4	9.0	4.1	10.9	5.2	5.7	34.0	100
1997	22.7	9.5	9.2	4.1	8.3	6.1	7.2	33.1	100
1998	20.9	9.3	9.0	3.5	8.2	5.9	6.7	36.6	100
1999	21.3	9.3	9.9	4.3	8.3	5.5	6.7	34.6	100
2000	20.3	9.7	10.5	4.1	8.5	5.6	6.7	34.7	100

Source: Adapted from Liu et al. (2004)

vegetable varieties accounts for more than 60% of the total vegetable output. The variety structure of vegetable production between 1995 and 2000 is presented in Table 2.3. The proportion of ordinary vegetable varieties (e.g. Chinese cabbage and tomato) declined, while the proportion of high-quality vegetable varieties (e.g. cucumber) increased. The variety structure of vegetable production fluctuated slightly from year to year because of the fluctuations in weather conditions and vegetable prices in markets. With the development of international markets, more and more new varieties will be introduced and cultivated in China.

#### 2.1.4 Regional structure of vegetable production

Vegetable production in China has a long history and is spread all over the country. Figure 2.1 shows the main vegetable production regions in China.

There are three major vegetable production regions in China. (1) The northern region, including Shandong, Hebei and Liaoning Provinces. Due to its unique natural conditions and



Figure 2.1. Main vegetable production regions in China.

well-developed facilities for vegetable production and marketing, this region sells vegetables broadly to other regions. (2) The southern region, including Guangdong, Guangxi, Fujian, Hainan, Sichuan, and Yunnan Provinces. This region has its comparative advantage in terms of warm climate. Vegetables are therefore produced for the markets in northern China, especially in winter time. (3) The central region, including Henan, Jiangsu, Hubei, Hunan, and Anhui Provinces. Vegetables are mainly produced to meet the demand within the region. Recently, however, international markets have been growing rapidly. The major vegetable production provinces (e.g. Shandong Province, Jiangsu Province, etc.) are increasingly selling vegetables to international markets to further increase their market performance.

Even though vegetable production is concentrated in the northern, central and southern part of China, all 31 provinces<sup>9</sup> in mainland China produce vegetables. According to the China Statistical Yearbook, in 2005 the vegetable output of the top 10 vegetable production provinces was 392.8 million tons, accounting for 69.6% of the total vegetable output in China (see Table 2.4).

### 2.1.5 Vegetable exports

Nowadays, the Chinese vegetable sector not only aims for domestic markets, but also for international markets. China's accession into the WTO in 2001 further strengthened China's vegetable position and improved its export prospects in the world, since China has a clear competitive advantage in labour-intensive vegetable production (Huang and Chen, 1999). Although only a small proportion of vegetable production goes to the international markets (about 1% of the total vegetable production), considering the huge amount of total vegetable production, China is one of the biggest vegetable exporters in the world. In 2000, China exported 2.45 million tons of vegetables, with a total value of 1.58 billion USD. In 2005, China exported about 5.2 million tons of vegetables, and the total export value reached 3.3 billion USD. Both the export volume and value were doubled. The annual growth rate of vegetable export was about 16% for the last five years in terms of export volume and value (Table 2.5).

Export vegetables are fresh, processed or dried. The major export varieties are garlic, shallot, onion, pepper, bean, potato, soybean, ginger, edible mushroom, pumpkin, and edible wild vegetables. Shandong, Fujian, Zhejiang, Xinjiang, Jiangsu, and Guangdong Provinces are major vegetable exporters in China. In 2005, the total export value of the six provinces was 2.4 billion USD, accounting for 72.7% of the total vegetable export value in China.

The main destination of China's vegetables are Southeastern Asia, the USA and Russia. Table 2.6 shows the five most important vegetable importers in 2005. The top five importers imported

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<sup>9</sup> China Statistical Yearbook provides yearly data for 31 provinces in mainland China, not including Taiwan, Hongkong and Macao.

*Table 2.4. Top 10 vegetable production provinces in China (year 2000 and 2005).*

<b>Province</b>	<b>Output 2000 (million tons)</b>	<b>% in total</b>	<b>Province</b>	<b>Output 2005 (million tons)</b>	<b>% in total</b>	<b>Growth rate (%)</b>
Shandong	72.6	15.9	Shandong	86.1	15.3	18.6
Hebei	44.5	9.8	Hebei	64.7	11.5	51.5
Henan	39.8	8.7	Henan	58.8	10.4	47.7
Jiangsu	31.9*	7.0	Jiangsu	36.0	6.4	12.9
Hubei	27.2	6.0	Hubei	29.2	5.2	7.4
Sichuan	23.1	5.1	Sichuan	27.1	4.8	17.3
Guangdong	22.1	4.8	Guangdong	26.0	4.6	18.6
Hunan	17.8	3.9	Hunan	24.0	4.3	34.8
Liaoning	17.6	3.9	Guangxi	21.4	3.8	33.9
Guangxi	16.1	3.5	Liaoning	19.5	3.5	21.1
<b>Sub total</b>	<b>312.7</b>	<b>68.6</b>	<b>Sub total</b>	<b>392.8</b>	<b>69.6</b>	<b>25.6</b>
Other provinces	143.1	31.4	Other provinces	171.8	30.4	20.1
<b>China total 455.9**</b>	<b>100</b>		<b>China total 564.5</b>		<b>100.0</b>	<b>23.8</b>

\*The vegetable output of Jiangsu Province was not available for 2000. The data provided here is the official estimation of Jiangsu Agriculture and Forestry Department.

\*\*This number was adjusted according to Jiangsu's data.

Source: China Statistical Yearbook, various issues.

*Table 2.5. Vegetable export in China (2000-2005).*

<b>Year</b>	<b>Export volume (million tons)</b>	<b>Export value (billion USD)</b>
2000	2.45	1.58
2001	2.98	1.75
2002	3.60	1.89
2003	4.32	2.20
2004	4.70	2.78
2005	5.20	3.30
Annual growth rate (%)	16.2	15.9

Source: China Statistical Yearbook, various issues.

Table 2.6. Five biggest China's vegetable importers in 2005.

Importers	Import volume (million tons)	% in China's total export volume (%)	Import value (billion USD)	% in China's total export value (%)
Japan	1.71	32.9	1.63	49.4
Korea	0.58	11.2	0.30	9.1
Malaysia	0.50	9.6	0.24	7.3
Russia	0.47	9.0	0.16	4.8
USA	0.34	6.5	0.34	10.3
Total	3.60	69.2	2.67	80.9

Source: 1. China Customs Statistical Yearbook, 2005.

2. <http://www.agri.ac.cn/manager/13151001/2006417152149.htm> (access date: June 11, 2006)

3.6 million tons of Chinese vegetables with a total value of 2.67 billion USD, accounting for 69.2% of the total export volume and 80.9% of the total export value respectively. Japan is the largest Chinese vegetable importer. In 2005, Japan imported 1.71 million tons of Chinese vegetables, accounting for almost one-third of the total export volume. The import value reached 1.63 billion USD, accounting for 49% of the total export value. The next four biggest importers are Korea, Malaysia, Russia, and the USA. In 2005, Korea imported about 0.58 million tons of vegetables from China, accounting for 11.2% of the total export value. Malaysia and Russia both imported about 0.5 million tons of vegetables respectively, accounting for about 9% of the total export value. The USA imported about 0.3 millions tons of vegetables, accounting for 6% of the total export value. A newly fast developing market for Chinese vegetables is the Association of Southeast Asian Nations (ASEAN)<sup>10</sup>. As much as 20% of Chinese vegetables were exported to the members of ASEAN in 2005, particularly to Malaysia and Indonesia. The European Union (EU) is another growing market for Chinese vegetables. However, the export volume and value are still rather small.

Based on export volume and value, we can calculate the average price for export vegetables for each country. The average export price for the USA and Japan are the highest (about 1USD/kg), while the average export price for Russia is the lowest (about 0.34 USD/kg). Noticeably, the average export price for Chinese vegetables in the international markets decreased about 20% from 2000 to 2003. The price depressing is partly due to strong competition between exporters, but also due to the importers' stringent quality and safety regulations on vegetables.

<sup>10</sup> The members belonging to the Association of Southeast Asian Nations are: Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei Darussalam, Vietnam, Laos, Cambodia, and Myanmar.

Chinese vegetables cannot always reach importers' quality requirements and sanitary conditions<sup>11</sup>.

### 2.1.6 Vegetable production method

The HRS is the basic farming system in China. Vegetables, too, are produced under this system. Based on the organisation of production, we can divide the households into two types: independent operation or integrated operation. In China's main vegetable production areas, the households are mostly of the independent operation type and rely on local wholesale and wet markets to sell their products. In these areas, the scale of production is rather small and a large part of the vegetables are grown for commercial use (trade). With the development of international markets and the rising of supermarkets in China, the integrated production (production companies and farmer cooperatives or associations) improves the possibility for smallholders to access to these modern high-value market outlets (Hu *et al.*, 2004).

Vegetable production scale in China is rather small. The average production scale per household ranges from 0.2 to 0.3 ha (Liu *et al.*, 2004). Outside the main vegetable production areas, the operational form of vegetable production is usually an independent and diversified one. In these areas, rural households grow vegetables during production intervals between the major crops and on odd pieces of land (such as roadsides). Consequently, vegetable production in these areas is seasonal, and production scale is very small. Vegetables are primarily for self-consumption, and only the surplus is sold at the market.

Supported by the Chinese government, vegetable production companies and farmer associations are growing very fast. Company-based vegetable producers are able to gain economies of scale and improve the capacities to implement new production technology and to apply new quality standards which are extremely difficult and almost impossible for individual farmers. Vegetable cooperatives and farmer professional associations (FPAs), on the other hand, gather individual smallholders together to carry out production and consumption-oriented activities to improve supply capacity and to enhance marketing power. It is estimated that there were about 100,000 FPAs in 2003 in China. About 7% of the villages, 2-3% of farmer households, and about seven million farmers participated in at least one of the FPAs (Shen *et al.*, 2005). Vegetable production companies and FPAs are recognised as the possible future for the Chinese vegetable sector.

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<sup>11</sup> Chinese vegetables were banned several times by several countries due to quality and safety problems. (1) USA, Canada, EU, Japan and Australia banned canned mushroom imports from China because of the finding of staphylococcus in canned mushrooms exported to the USA in 1988, which led to over 90% of the drop of Chinese canned mushroom exports. (2) Japan carried out a stringent sanitary inspection policy from 2000 onwards. One-third of Chinese vegetables cannot enter the Japanese market. (3) Since April 2001, Japan has started to inspect all imported vegetables from China. This dramatically increases the waiting time and leads to vegetable quality deteriorations.

## 2.1.7 Vegetable cultivation technology

Vegetable cultivation technology not only increases vegetable productivity, but also improves the quality and competitiveness of China's vegetables in international markets. The most important technologies for vegetable production include new production facilities, varieties, cultivation techniques, and packing and transportation methods. It is estimated that technological progress contributed to more than 50% of the growth in vegetable production - about 10% higher than its contribution to the growth of China's agriculture in general (Tan and Xin, 2001).

One of the significant technical improvements for vegetable production is the application of solar greenhouses. The traditional solar greenhouse in China is the one built with bamboo sticks and plastics. Recently, the use of steel tubes is more popular, which increases the life of the greenhouses. The source of energy is mainly solar radiation (normally there is no heating system, although a small part of them do use it). Usually the greenhouse covers a limited production area between 150 to 800 m<sup>2</sup> (width: 5-10 m. length: 30-80 m, see Figure 2.2) which can be easily managed by individual households with about three persons. Modern western-style glasshouses are rare (approximately 100 ha in total) and are mainly government demonstration projects or foreign investments.

The application of greenhouses in vegetable production dramatically increases vegetable productivity and effectively solves the discrepancy between supply and demand for year-round fresh vegetables. The total area of greenhouses for vegetable production in China was 7,200 ha in 1980, with an output of about 200,000 tons. In 2000, the total area reached 1.7 million ha, about 220 times that in 1980. The aggregate output of vegetables produced in greenhouses reached 87 million tons, about 400 times that in 1980. The annual growth rate for greenhouse area and output were 31.4% and 35.5% respectively (see Table 2.7).



Figure 2.2. Chinese popular solar greenhouses for vegetable production.

Note: Pictures are obtained from [www.chaoda.com](http://www.chaoda.com), access date: December 22, 2006.

*Table 2.7. Development of greenhouses in China's vegetable production.*

<b>Year</b>	<b>Greenhouse area (1000 ha)</b>	<b>Percentage of total vegetable-sown area (%)</b>
1980	7.2	0.2
1985	46.8	0.9
1990	169.2	2.6
1995	900.4	9.5
1996	996.5	9.9
1997	1,221.8	10.7
2000	1,700.0	11.2
Annual growth rate (%)	31.4	22.3

Source: Liu *et al.* (2004).

*Table 2.8. Comparison of vegetable yield across several selected countries.*

<b>Year</b>	<b>Vegetable yield (tons/ha)</b>					
	<b>USA</b>	<b>Japan</b>	<b>Poland</b>	<b>Spain</b>	<b>Netherlands</b>	<b>China</b>
1980	19	28	14	18.8	40.7	14.4
1985	21	28	19	20.0	44.4	16.0
1990	23	27	23	22.9	53.2	17.7
1995	25	28	22	26.2	50.9	18.8
1999	26	27	25	29.6	54.9	16.9
Annual growth rate (%)	1.7	0.0	3.1	2.4	1.6	0.8

Source: Liu *et al.* (2004).

Although China has made huge progress in introducing new technologies for vegetable production, the technology still lags behind that in developed countries. The gap between China and those countries can be illustrated by the differences in yield (Table 2.8). In 1999, the vegetable yield in China was 68.6% of that in Poland, 65.7% of that in the USA, 62.7% that in Japan, 57.3% that in Spain and 30.8% that in the Netherlands. Table 2.8 shows that since the 1980s, the vegetable yield in China has increased more slowly than that in other countries (except for Japan).

## 2.2 The structure of vegetable markets

Current vegetable markets in China are a complex system consisting of large-scale wholesale markets, retail markets (mainly wet markets and supermarkets) and international markets (see Figure 2.3). There is no data available to depict the share of vegetable distribution in each channel. Based on the field interviews and discussions with different actors in the vegetable sector, more than half of the vegetables are sold to traders (at the fields or at the wholesale markets), about one-third are sold at the wet markets by vegetable producers. The rest of the vegetables (about 15%) are delivered to supermarkets, processing companies and exporting companies.

Traders play an important role in bridging vegetable producers and the markets. Traders are important vegetable buyers in the fields. Large traders become wholesalers at the wholesale markets. Some traders function as important retailers at the wet markets. Some traders act as brokers to connect vegetable producers with processing and exporting companies. We did not distinguish the different roles the traders play in this study; they are generally recognised as traders.

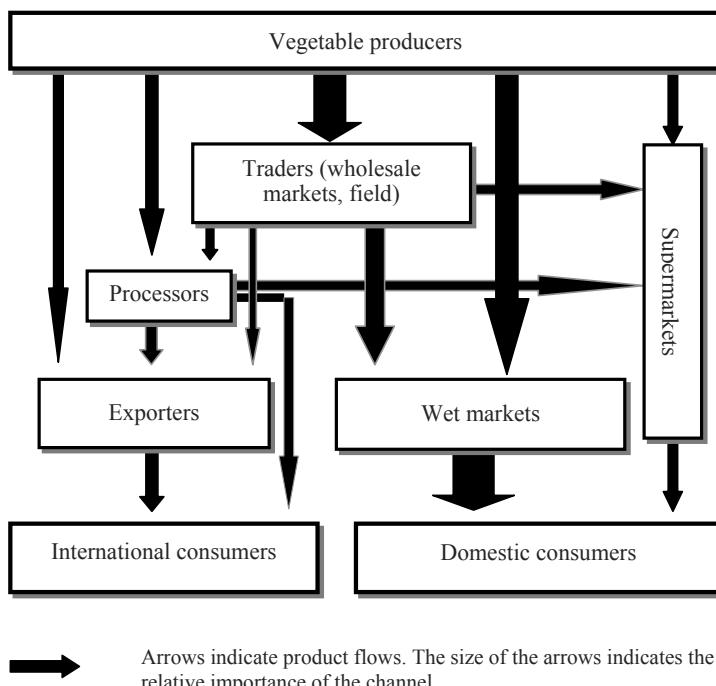


Figure 2.3. Vegetable market structure in China.

Vegetable processing companies, exporting companies and supermarkets are important vegetable buyers in China. More and more fresh vegetables are sold at the supermarkets and are processed and exported to international markets. As previously discussed, although the share of vegetables for export is rather low (about 1%), it has increased rapidly in recent years. It is estimated that vegetable sales in the supermarkets will increase tremendously for the next several years in China (Hu *et al.*, 2004). Thus we expect that vegetable farmers will diversify their vegetable sales and gain more profits from the emerging modern domestic markets (e.g. supermarkets and processing companies) and international markets (we will discuss this below).

Chinese vegetable markets can be distinguished into three market segments. Each has its distinct characteristics in terms of production, marketing, organisation, quality and safety requirements, value-added, and buyer-seller relationships. The three market segments are (1) the traditional local markets; (2) the emerging modern domestic markets; and (3) the export markets. Table 2.9 summarises the characteristics of the three market segments.

Millions of small-scale farmers produce vegetables for their own consumption and for local markets. Particularly, they produce a limited number of varieties and in small volumes. About 90% of the total vegetable production are still sold in the traditional markets (World Bank, 2006). There is relatively low awareness of food safety issues, insufficient control over the use of pesticides, limited technical support, and little control of quantity. Vegetable production is supply driven, with low output prices and unstable supply. Incentives for farmers to improve food quality and safety are weak. Competitiveness depends largely on low cost. Hence, this market is characterised by heterogeneous quality, unreliable food safety, fluctuating supply, and uncertain demand. The transaction costs are high, due to information asymmetry and a high waste rate resulting from poor handling practices. Recently, there is a trend to improve the organisation level in order to control quality and safety as a response to consumer requirements.

The export markets at the opposite end of the spectrum are demand driven and highly sensitive to food quality and safety. They control vegetable supply chains, increasingly with tracking and tracing systems in place, and with higher prices. In export markets, investments in food quality and safety are required and often show high returns. Small-scale farmers are almost excluded from this market. Only well organised farmers may have access. Processing and exporting companies are active players in this market. Cooperation and collaboration are high between producers, processors, exporters, and international buyers. Integrated supply chains are therefore emerging in this market. Growth of export depends on the improvement of technology, quality, and safety as well as the enlargement of the assortment and supply base in China.

The emerging modern domestic markets range in between. A significant development in China's domestic food retailing market is the rapid rising of supermarkets during the last decade (Hu *et al.*, 2004). Although the current share of supermarkets in total sales of fresh vegetables is still low (about 3% in urban areas, much lower in rural areas), it is expected to

Table 2.9. Characteristics of three market segments.

Market characteristics	Market segments		
	Traditional local markets (i.e. the wet markets and wholesale markets)	Emerging modern domestic markets (i.e. processing companies, supermarkets)	Export markets (i.e. international markets)
<b>Market participation</b>			
Participation of small-scale producers	No constraints	Emerging constraints in meeting requirements of quality, safety, consistency of product, regular supply	Only if well organised in out-grower schemes and able to guarantee safety and uniform quality
<b>Organisation</b>			
Chain leader/ coordinator	Usually none	Large producer or buyer, sometimes producer organisation	Processing company or exporter; sometimes importer on behalf of retailer; rarely the retailer directly
Potential role of producer cooperative	Countervailing power, economies of scale in acquiring inputs and market access	Economies of scale, finding and developing markets, scaling-up volume with consistent quality	Reduce transaction and information costs in supply chain Trust-worthy partner for planning and coordination
Supply chain organisation	Supply driven Transaction-based Little or no net benefit from coordination Little durability in relation among private actors No technical cooperation	Efforts by retailers to control quality, safety, and reliability of supply Net financial benefits from coordination still fragile Emerging coordination, occasional technical support	Strongly demand driven Durable relations within supply chain, often on contractual basis Cooperation among buyers, exporters, growers on technology, information, sometimes finance
Trust between buyers and sellers	Not very important	Of emerging importance	Crucial factor for long-term successful relations

Table 2.9 Continued.

<b>Market characteristics</b>	<b>Market segments</b>		
	<b>Traditional local markets</b> (i.e. the wet markets and wholesale markets)	<b>Emerging modern domestic markets</b> (i.e. processing companies, supermarkets)	<b>Export markets</b> (i.e. international markets)
<b>Marketing characteristics</b>			
Competitiveness depends mainly on	Supply at low cost	Sufficient quantity Improved quality	Large quantity Efficient, effective coordinated supply chains Flexible response to changing demand Market and product innovation
Price level for grower and consumer	Relatively low Limited willingness to pay for quality and safety	Moderate Moderate willingness to pay for quality and safety	Relatively high High willingness to pay for quality and safety
Value-added	Very low	Low/moderate	Moderate/high
Standardisation, grading, supply	Virtually absent Irregular supply	Emerging importance of grading, stable supply	High requirements of grading, consistency, supply schedule
Food safety control	Unreliable Little consumer awareness, concern Little private effort, limited government control	Improving Emerging consumer awareness, concern Retailers try to control and sell 'safety'	Effective High consumer concern High retailer requirements imposed on suppliers
Food safety awareness and compliance	Low	Emerging	High

Source: Adapted from World Bank (2006)

have a very fast growth rate (World Bank, 2006). The main factors in this expansion are the attractiveness of supermarkets to modern consumers and the technical and logistic advantages of modern retailing over traditional retailing.

Although supermarkets are able to handle processed foods and fresh products with a longer shelf life, they have major difficulties in handling fresh vegetables (Chen *et al.*, 2005; Shepherd, 2005), leading to a low profitability. Quality and safety awareness and compliance are lower in supermarkets compared to that in export markets. Supermarkets still source their vegetables from wholesale markets and from companies that cannot meet export requirements. Thus there is still a major gap in quality and safety standards between supermarkets in China and in developed countries. However, there is an emerging coordination between supermarkets and vegetable suppliers. Some supermarkets even build up their own vegetable production bases with close collaboration with selected farmers. In these bases, technology, inputs, and even finance are offered by the supermarkets.

### 2.3 Vegetable quality and safety standards

China has developed three types of quality standards, namely 'Pollution-Free Food', 'Green Food' and 'Organic Food'. Green Food has two different levels: Green A and Green AA. Green AA food quality standards are equal to the standards of Organic Food. The quality standards for Pollution-Free Food are the lowest. The Chinese central government has implemented Pollution-Free Food quality standards as the basic quality standards. The quality standards for organic food and green AA food are the highest. Green A quality standards range in between. A graphic illustration is shown in Figure 2.4.

Each quality standard has its own content and distinguishable logo (see Table 2.10). The application procedures and administrative issues are also different. Pollution-Free Food quality standards are the result of The Action Plan for Pollution-Free Agricultural Products (APPAP) which was formally launched in 2001 by the MOA. The safety of fresh vegetables was the first issue to be tackled by the APPAP. The quality standards for Pollution-Free Food are compulsory standards for agricultural products in China. The Green Food standards were established by the

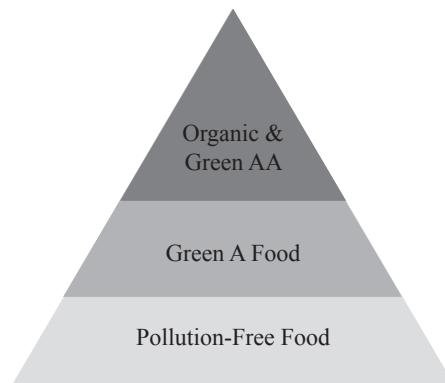


Figure 2.4. Food quality standards in China.

*Table 2.10. Vegetable quality and safety standards in China.*

	<b>Pollution-Free Food</b>	<b>Green Food</b>		<b>Organic Food</b>
		<b>Grade A</b>	<b>Grade AA</b>	
Initiation background	China	China		Europe, USA
Initiation time	2001	1990		1994
Certification organisation/agency	Provincial Agricultural Department (production base) The Centre for Agri-food Quality and Safety, Ministry of Agriculture (agricultural products)	China Green Food Development Centre (GFDC), Ministry of Agriculture (MOA)		Organic Food Development Centre (OFDC), State Environmental Protection Administration (SEPA)
Certification content	Production environment Production procedure Product quality	Production environment Production technology Products Package, storage and transportation		Production Processing Labelling and marketing Management system
Valid period	3 years	3 years		1 year
Logo				
Quality standards	Low	Middle	High	High
Production technology	Use of permitted chemical fertilisers and pesticides	Limited use of chemical fertilisers and pesticides	No use of chemical fertilisers and pesticides, no use of genetically modified organisms (GMOs)	No use of chemical fertilisers and pesticides, no use of GMOs
Production base (production bases or raw materials)	No requirement for conversion period	No requirement for conversion period	No use of chemicals for at least 3 years; or require 2-3 years conversion period	No use of chemicals for at least 3 years; or require 2-3 years conversion period

Source: Prepared by author.

Green Food Development Centre (GFDC) in the year 1990 on behalf of the MOA. The Green Food quality standards are voluntary standards. The objective of the development of Green Food quality standards is to protect ecological environments, upgrade agricultural product quality, accelerate the development of food processing industries, improve people's health conditions, and increase agricultural exports. The organic food standards are also voluntary standards set by the State Environmental Protection Administration (SEPA), including standards for environment (water, soil and air), production technology (inputs, fertilisers and pesticides), products (chemicals residual) and packaging, processing and transportation.

## 2.4 The vegetable sector in Jiangsu Province

### 2.4.1 Vegetable production

Jiangsu Province, located in the middle-east of China (Figure 2.5), is an economically well-developed area in China. Jiangsu has notable differences of four seasons, which is beneficial to the growth of crops, livestock, aquatic products, and plants. Most vegetable varieties can be produced in this province. Jiangsu has a long vegetable production history; more than 50 varieties are widely cultivated year round.

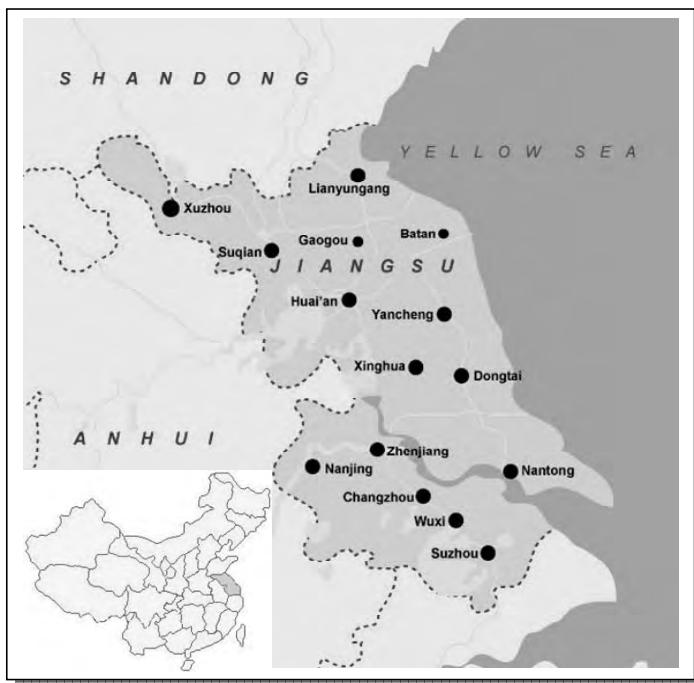


Figure 2.5. The location of Jiangsu Province.

During the last few years, the vegetable sector in Jiangsu Province is the focus of agriculture structural adjustment. Therefore, the vegetable-sown area, output and value increased. Vegetables are the second largest crop after grain. Vegetable production has become farmers' first important agricultural activities and an important source of income. Specialised vegetable produce bases have been built up; new varieties and technologies have been introduced.

Table 2.11 shows the vegetable-sown area, output and value in Jiangsu Province since 1990. We can see that vegetable production in Jiangsu Province has had stable development over the last 15 years. In 2005, vegetable-sown area and output reached 1.19 million ha and 36 million tons, 2.7 times that in 1990. The vegetable-sown area and output in Jiangsu Province accounted for about 6% that in China. The annual growth rate of the vegetable-sown area and output was about 7% for the last 15 years. In 2005, the vegetable production value reached 4.9 billion USD, 10 times that in 1990. The annual growth rate of the vegetable production value was about 18%, higher than that of the sown area and output. This can be explained by the increase of vegetable prices. Based on total vegetable value and total vegetable output, we calculated average vegetable prices. We found that vegetable prices increased continuously for the last 15 years, especially in the period of 1990-2000. This may be the response to vegetable market liberalisation. For the last five years, vegetable prices have been growing but with a low rate. The average vegetable price in 2005 is 4.7 times higher than that in 1990.

Table 2.11. Vegetable production in Jiangsu Province (1990-2005).

Year	Sown area (million ha)	Output (million tons)	Value (billion USD)	Average prices (USD/kg)
1990	0.44	13.25	0.4	0.03
1995	0.60	17.69	1.3	0.07
2000	1.06	35.00	3.2	0.09
2001	1.18	35.62	3.6	0.10
2002	1.29	39.52	4.1	0.10
2003	1.34	37.23	3.7	0.10
2004	1.22	36.79	4.4	0.12
2005	1.19	36.05	4.9	0.14
Annual growth rate (%)	6.9	6.9	18.2	--

Source: Jiangsu Statistical Yearbook, various issues; Jiangsu Agricultural Economics Statistics, various issues.

## 2.4.2 Added value in the vegetable supply chains

Compared to other participants, vegetable producers are less powerful in vegetable supply chains. As a result, they have a weak position in vegetable transactions (especially in the negotiation process). Empirical evidence indicates that primary producers obtain only a small part of the added value<sup>12</sup> in vegetable supply chains, while retailers stand in a dominant position (Luo, 2004; Ruben *et al.*, 2007a). For a better understanding of the position of all chain participants in vegetable supply chains in Jiangsu Province, we further investigated the distribution of added value throughout the chain. To be simple, we take Nanjing tomato chains as an illustration.

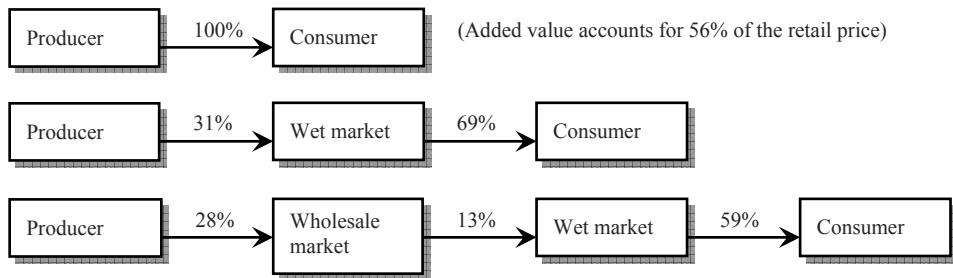
Several studies have calculated the added value for tomato chains in Nanjing City. Luo (2004) carried out a survey with 112 retailers and 36 wholesalers in Nanjing in 2004. They collected price information at the producer, wholesaler and retailer levels, and calculated the price differentiation to show the added value throughout the chains (Figure 2.6). They concluded that producers get all added value (added value accounts for 56% of the retail price) if they sell their tomatoes directly to the consumers. If producers sell their tomatoes via retailers, they gain 31% of the added value. If producers sell their tomatoes via wholesalers, they acquire a bit less (28%) added value. Wholesalers achieve 13%, and the rest of the added value (59%) goes to the retailers.

This example shows that producers obtain less added value from the markets when the vegetable supply chains become longer. This is because the retail prices for tomatoes are similar at the wet markets and supermarkets for competition reasons. In other words, no matter where the tomatoes come from, they are sold nearly at the same prices when they have the same quality standards. If more participants are involved in the supply chain, the added value is shared by all participants. Results also indicate that the retailers get most of the added value in tomato chains in Nanjing (69% and 59% of the added value for the latter two tomato chains).

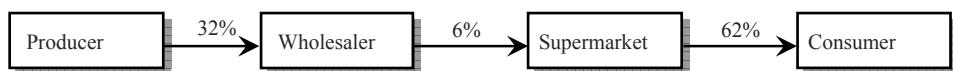
The study of Luo (2004) also suggests that for vegetable producers, selling their tomatoes directly to consumers is the best choice. However, direct selling requires sufficient marketing knowledge. Transportation and time also restrict most of vegetable producers to sell their tomatoes directly, as vegetable production is labour-intensive and time consuming.

Ruben *et al.* (2007a) conducted a supply chain cost analysis in Nanjing and identified the major cost categories involved in tomato supermarket supply chain (see Figure 2.7). Based on the prices received by each chain participant, they calculate the total added value and the distribution of added value for each chain participant.

<sup>12</sup> Added value is defined as 'Increase in value acquired by materials, components, or other commodities (including labour for example) as a result of any input, whether processing, assembling, handling, distributing, and marketing.' (Adopted from: [http://en.mimi.hu/marketingweb/added\\_value.html](http://en.mimi.hu/marketingweb/added_value.html), access date: January 4 2007). Here we define added value based on the price differences at different stages in the supply chains.



**Figure 2.6. Added value in tomato wet market and wholesale market chains in Nanjing.**  
Source: adopted from Luo (2004).



**Figure 2.7. Added value in tomato supermarket chain in Nanjing.**  
Source: adopted from Ruben et al. (2007a).

Results suggest that about one-third of the added value is obtained by tomato producers and two-thirds is obtained by the supermarkets. This finding is consistent with the earlier finding by Luo. Again the retailer (supermarkets) gains the most of total added value (62% of total added value). The wholesaler, however, only achieves a small part of the total added value (6%) in this tomato chain.

As discussed in Section 2.1, tomato is one of the top five vegetables in China. These two studies confirm that vegetable producers share a part of the added value in vegetable supply chains. They also show that vegetable producers may achieve a higher added value in supermarket supply chains. The rapid rising of supermarkets indicates that small-scale vegetable producers are increasingly facing market opportunities and challenges in developing countries like China (Reardon et al., 2003; Hu et al., 2004; Reardon and Timmer, 2005). The major constraints for small-scale vegetable producers are high quality standards, consistent delivery and large volumes.

#### 2.4.3 Vegetable export

Jiangsu is one of the most important vegetable export provinces in China. In 2005, Jiangsu exported 0.36 million tons of vegetables with a total value of 212.8 million USD. Over the last six years, the annual growth rates of export volume and value were 22.6% and 17.1% respectively (see Table 2.12). Export vegetables in Jiangsu Province can be categorised into three groups: fresh and frozen vegetables, processed (cut, sliced, salted etc.) vegetables and dried vegetables. Fresh and frozen vegetables account for 60% of total export. Processed vegetables account for 35% of total export. The rest, about 5% of vegetable export, are dried vegetables. The export

Table 2.12. Vegetable export in Jiangsu Province.

Year	Export volume (million tons)	Export value (million USD)
1999	0.11	87.5
2000	0.12	96.6
2001	0.15	109.5
2002	0.18	108.2
2003	0.19	135.5
2004	0.27	163.6
2005	0.36	212.8
Annual growth rate (%)	22.6	17.1

Source: Jiangsu Statistical Yearbook, various issues.

vegetables include over 50 varieties, of which, the most exported varieties are mushrooms, bamboo roots, lotus, garlic, asparagus, onion, carrot, burdock, cabbage, edible fungi, and wild vegetables. Vegetables in Jiangsu Province are mostly exported to Japan, Korea and the USA. A small proportion is exported to the EU.

The increase of vegetable export is partly due to the increase of the production scale and specialisation. It is also benefited from government support. Jiangsu is the first province in China that has launched a registration system of export production bases. This system is aimed to control the quality and safety of vegetable products, and to improve tracking and tracing throughout the chains. At the start of the production season, producers should report their production plan to their local department of quality supervision, inspection and quarantine. All inputs used and the process of harvesting, processing, packaging and transportation are regulated by the local authority. Quality standards and varieties are based on the requests of the international buyers. In Jiangsu Province, there are about 270 production bases with a total area of 19,000 ha registered as export production bases in 2006.

## 2.5 Concluding remarks

In this chapter we provide an overall picture of vegetable production and marketing in China in general and in Jiangsu Province in particular. The emergence of the vegetable market can be divided into four different stages in terms of market policy, price policy, marketing structure, and organisation. With the fast development of the vegetable sector in terms of production scale, vegetable processing and vegetable exporting, China plays an important role in international vegetable markets. Three significant market segments are identified and distinguished regarding market participation, organisation and marketing characteristics.

Three types of vegetable quality standards (Pollution-Free, Green and Organic Food standards) are introduced.

In summary, the vegetable sector plays an important role in China because of its role in increasing agricultural productivity, generating cash income and absorbing surplus labour. Jiangsu Province, as one of the developed economic zones in China, has a rapid developing vegetable sector with a clear intention to upgrade vegetable quality and improve export perspectives. Further improvement of the effectiveness and efficiency of vegetable supply chain in Jiangsu Province will benefit not only the numerous smallholders but also the other participants in the chain.

# Chapter 3 Theoretical overview

This chapter reviews the theories which will be used to explain buyer-seller relationships from an economic, organisational and social perspective. In Section 3.1, we start with the discussion of supply chain management theory to explain how business transactions are conducted in the entire supply chains. In Section 3.2, network and social capital theory are introduced to explain buyer-seller relationships from chain and network perspectives. Transaction cost economics and governance mechanisms in buyer-seller relationships are discussed in Section 3.3. We focus our discussion on the understanding of the behaviour of the chain actors. Transaction cost economics is used to explain the governance choices in the chain. Relational governance is recognised as the way to reduce transaction costs and to achieve long-term business relationships and therefore, better performance. Thereafter, the Chinese culturally embedded concept of *guanxi* networks and the linkages between *guanxi* and the previously discussed theories are examined in Section 3.4. Finally, the performance measurement for buyer-seller relationships is discussed in Section 3.5. This chapter ends with some concluding remarks.

## 3.1 Supply chain management

Study of business networks has much to gain from the existing literature on supply chain management. Scholars have recognised the importance of chain and network science (Omta *et al.*, 2001). The concept of Supply Chain Management (SCM) originated in logistics literature, specifically in purchasing literature (Trienekens, 1999). As Cooper and Ellram (1993) described: '*The term Supply Chain Management first appears in the logistics literature as an inventory management approach. Houlahan (1985)...describes excess inventory building as akin to snowdrifts against a fence; the more independent entities, the more fences with snowdrift.*'

Supply chain management asserts that the way that firms pursue their objectives is to seek cooperation in chains, since chains can raise performance levels above those attainable in spot-market operations. Thus one of the most significant paradigm shifts of modern business management is that individual businesses no longer compete as solely autonomous entities, but rather as supply chains (Lambert and Cooper, 2000). Various definitions of the supply chain emphasise the flow of value between organisations and describe chain cooperation. Hagelaar and van der Vorst (2002) highlight four definitions that have come out of the debate:

*By focusing on consumer needs a temporary and partial network will develop of common activities and exchange of people, resources and information (Zuurbier *et al.*, 1996).*

*The integration of business processes from consumer to the original suppliers leads to product-service information that has added value to customers (Lambert and Cooper, 2000).*

*A supply chain is a system whose constituent parts include material suppliers, production facilities, distribution services and customers, linked together via the feed-forward flow of materials and the feedback flow of information and financial capital (Stevens, 1989).*

*A supply chain is a network of organisations involved through upstream and downstream linkages in different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer (Christopher, 1998).*

These definitions differ in many respects. However, each emphasises that a product is transferred between firms before it reaches the consumer; thus a 'chain network' of firms transacting with each other is built (Omta *et al.*, 2001). Four major characteristics of a supply chain were distinguished by Cooper *et al.*, (1997).

- It evolves through several stages of increasing intra and interorganisational, vertical coordination; and spans from the initial source (the supplier's supplier, etc.) to the end consumer (the customer's customer, etc.).
- It potentially involves many independent firms. Thus managing intra- and inter-organisational relationships is essential.
- It includes the bidirectional flow of products (materials and services) and information and the associated managerial and operational activities.
- It seeks to fulfil the goals of providing high customer value with an appropriate use of resources and building competitive chain advantages.

Figure 3.1 depicts a typical supply chain network structure. It shows that supply chain management places a firm in the centre of a network of suppliers and customers with process links between them. The 'horizontal structure' refers to the number of suppliers/buyers at each tier level. The number of tiers across the supply chain has been termed as the 'vertical structure'. The ranking of the tiers is subject to the perspective of the company that is chosen to be the focal firm of the supply chain. The 'vertical position' refers to the focal firm's distance from the initial source of supply to the ultimate consumer. Obviously, the focal firm is not linked to all tiers of the chain directly; however, indirectly it is.

Since the drivers for integration are situational, the levels of integration should vary from link to link, and over time, because some links are more critical than others (Hakansson and Snehota, 1995). Lambert and Cooper (2000) distinguish four types of business process links between the members of a supply chain: managed business process links, monitored business process links, unmanaged business process links, and non-member business process links (see Figure 3.1). 'Managed process links', the links with the first-tier suppliers and buyers, are the most important links for the focal firm. 'Monitored process links' are less critical to the focal firm, but they nonetheless require some attention, since the links must be appropriately managed by other chain members. 'Unmanaged process links' are the links in which the focal firm is not actively involved and which are not critical enough to use resources for monitoring. 'Non-member process links' exist between members of the focal firm's chain and non-members

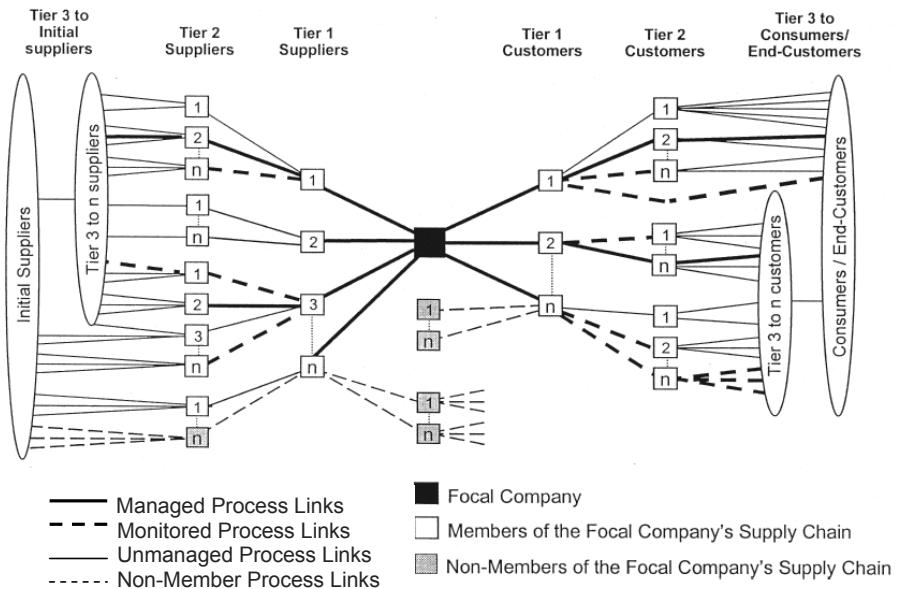


Figure 3.1. Supply chain network structure.

Source: Adapted from Lambert *et al.* (1998).

of the supply chain (e.g. competitors). These type of links are not considered as links of the focal firm's supply chain structure, but they can and often will affect the performance of the focal company and its supply chain (Lambert and Cooper, 2000). Every process link is a relationship. Together they form the network of a supply chain. The supply chain is more than the sum of its individual members, because the members maintain relationships with each other (Davis and Goldberg, 1957). Thus how the supply chain is managed depends on the way the relationships are organised.

Stock and Lambert (2001) identified two different categories of chain members. The 'primary supply chain members' are those firms that proactively involve in the sequential processes and activities that produce a specific product or service. In contrast, the 'supporting members' of a chain are companies that simply provide resources, knowledge, utilities, or assets to the primary members. This terminology derives from Porter's (1985) method of distinguishing between value-adding and support activities in his 'value chain' framework (see Figure 3.2 as an illustration).

Within the supply chain, relationships may take on a variety of legal forms, including vertical integration, long-term contracts, and market transactions. Cooper and Ellram (1993) view supply chain management as lying between fully vertically integrated systems and those in which each member operates completely independently, in other words, spot-market governance. Slack *et al.*, (2001) distinguished five forms of organising relationships in a supply

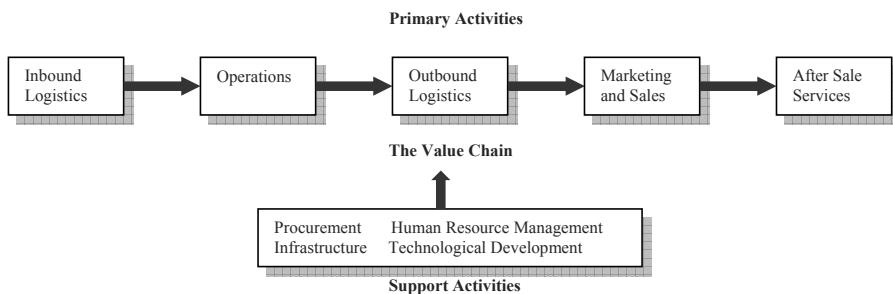


Figure 3.2. Porter's value chain model (Porter, 1985).

chain: short-term contract, long-term contract, coordinated profit sharing, long-term alliance, and the joint venture (Figure 3.3).

The spot market is described by Williamson (1985) as discrete exchanges wherein the identity of parties, the time dimension and the product characteristics do not matter. An illustration of this discrete exchange is the situation in which there is a '*one-time purchase of unbranded gasoline out-of-town at an independent station paid for with cash*' (Dwyer and Oh, 1987). In vertical integration, however, all activities, from sourcing raw materials up to the sale to end consumers, are coordinated by a single company. Although such extreme manifestations are seldom found in practice, the notion of pure forms provides a useful analytical baseline from which the intermediary forms can be derived.

*Short-term contracts* are single transactions after which the relationship ends. This form of organisation often comes about through price negotiations, and sometimes information flows and other factors play a role (e.g. a reputation of having been cheaper in past transactions). Goods bought through short-term agreements are mostly standardised products unrelated to core production processes. Eventually, such agreements may be used as a trial when a firm is looking for a new partner. Most decisions are based on cost reduction and price. Consequently the benefits of a longer-term agreement, such as collaboration and better coordination of activities and resources, are lacking.

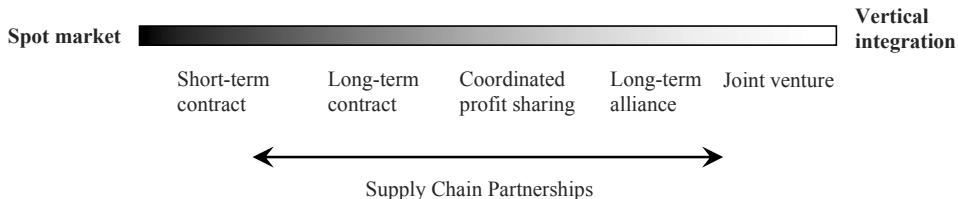


Figure 3.3. Forms for organising relationships in a chain.

Source: Adapted from Slack et al., (2001).

In real life, many trade agreements are made without a formal contract that legally binds firms. Slack *et al.*, (2001) call these relationships *semi- and long-term trade agreements* when, for instance, a firm supplies a buyer a (fixed) quantity of a certain product during a certain time period. The price is often settled beforehand. The implications for vertical coordination are important for the firms' competitive advantage because such agreements can reduce risks of opportunism or shortages.

*Coordinated profit sharing* requires a certain degree of legal formalisation. This form of organising a relationship is often used for licensing and franchising. Proprietary goods, services or information are transmitted to mainly smaller organisations from which the owner receives a fixed guaranteed income. The service sector (e.g. fast food) uses this kind of agreement.

*Alliances* are forms of organisation which entail the mutual exchange of property rights, technology, employees, information, goods and services while the firms remain independent. They keep their own identity, culture and structure; however, freedom of either party may be limited. *Joint ventures* are a special type of alliance in which a new firm is created and owned by the alliance partners. Alliances and joint ventures generally aim to share risks, revenues, technology, and innovations, and they are characterised by high dependence (Kemp, 1999).

In our view, any of the forms discussed above can be found in buyer-seller relationships, bounded at one extreme by complete vertical integration and at the other extreme by the pure spot market. Buyer-seller relationships might be long-term or short-term and may or may not be governed by a formal contract. The buyer-seller relationship can therefore be understood as an exchange between two parties that involves not only a transaction but also social elements (Claro *et al.*, 2003). No firm does business without thinking about exploiting a benefit. Transactions do not occur in a vacuum, but rather are surrounded by the social structure, the network of connected relationships of suppliers and buyers. One could link this structure to lubricants that in economic transactions enable the positive behaviour of human beings to prevail over self-seeking behaviour (Arrow, 1974; Granovetter, 1985).

Studies of buyer-seller relationships have been primarily based on economic and organisational theories (Claro, 2004). The theories most frequently used are transaction cost economics (Williamson, 1985), network theory (Granovetter, 1985), social capital theory (Coleman, 1988) and relationship marketing (Christopher *et al.*, 2002). Each of these theories offers its own focus, assumptions and framework for studying buyer-seller relationships. Nevertheless, they do provide overlapping and rather complementary explanations for buyer-seller relationships. Research in the field of buyer-seller relationships has shown that collaborative modes of governance successfully replace the price mechanism where there is, for instance, an influential connected relationship and transaction specific investments (e.g. Anderson and Narus, 1990; Anderson *et al.*, 1994). All these theories can therefore be used to explain buyer-seller relationships.

## **3.2 Network and social capital theory**

It has been noted by researchers in strategy and organisation that networks play an important role in the performance of an organisation. Organisations or firms doing business are part of a value chain and are dependent on external actors and changes in environment. The firm's ability to build and maintain an interorganisational network of relationships is increasingly viewed as key to sustained competitive advantage (Kogut, 2000; Omta *et al.*, 2001). In addition, for firms, relations with external actors are important for exploring business opportunities, for gaining access to resources such as information, capital and expertise, and getting advice, guidance and endorsement (Birley, 1985; Aldrich and Zimmer, 1986; Greve, 1995; Scholten, 2006). Thus social networks play an important role in achieving a better market performance for firms by helping to get access to markets and by providing new business opportunities.

### **3.2.1 Network theory**

Building on social exchange literature, researchers in the past decade have moved beyond the dyadic level to look at the effects of the overall structure of relationships in which firms are embedded (Granovetter, 1985). Networks have also received attention in a wide range of organisational literature, from sociology to management and economics. A network perspective has emerged, which views organisations as nodes embedded in a network of organisations that facilitate as well as constrain them by guiding their interests and ability to take actions (Hakansson, 1982; Powell, 1990; Nohria and Eccles, 1992). Granovetter (1985) presented the essence of this perspective: '*Actors do not behave or decide as atoms outside a social context, nor do they adhere slavishly to a script written for them by the particular intersection of social categories that they happen to occupy. Their attempts at purposive action are instead embedded in concrete, ongoing systems of social relations.*'

Menard (2002) defines a network as '*...all arrangements defining a set of recurrent contractual ties among autonomous firms.*' Similar definition is provided by Borgatti and Foster (2003) '*...a network is a set of actors connected by a set of ties.*' Diederden and Jonkers (2001) consider that '*... a basic assumption of network relationships is that one party is dependent on the resources controlled by another and that there are gains to be had by the pooling of resources.*' The authors add '*...the network is characterised by the specific properties of the transaction relationships, typified by relational relationships in which formal and informal sharing and trust building mechanisms are crucial.*' Omta *et al.* (2001) suggest an alternative definition of network as '*...the total of actors within one industry and/or between related industries, which can potentially work together to add value to customers.*' Lazzarini *et al.* (2001), in shaping the concept of net-chain, distinguish network analysis from supply chain analysis, proposing that '*...network analysis provides numerous tools to map the structure of interorganisational relationships or ties based on the recognition that network structure contains and at the same time is shaped by firms' actions.*' Claro (2004 p.37) defines network as '*... the set of connected business relationships of an organisation that can be separated in sub-groups and form essential sources of valuable information*

*that offers benefits to buyer-supplier relationships in terms of internal processes, trade conditions and foreseeing actions of counterpart.'*

Although the definitions point more or less to the same direction, most are not precise about the application of the concept and do not discuss its nature (Zylbersztajn and Farina, 2005). The definitions of networks vary according to the focus of the discipline. In general, studies in sociology pay more attention to social elements, such as aid and relational bonds, while studies in management science pay more attention to opportunities and control (Claro, 2004).

Networks of organisations emerge because of the necessity to exchange resources (Hines, 1995; Trienekens, 1999). Therefore networks have significant implications for buyer-seller relationships and business transactions. According to Thorelli (1986), power is the central concept in network analysis. He recognises at least five sources of power of a network participant: economic bases (e.g. liquidity, access to supplier); technology (systems, product and product technology); expertise (personnel and equipment capabilities); trust (reputation and past performance); and legitimacy (e.g. ownership relationships and contracts). Uzzi (1997) mentions trust as the primary governance factor in an embedded logic of exchange. Larson (1992) highlights the importance of reputation, trust, reciprocity, and mutual interdependence in networks. Thus the network is not to be viewed as a substitute for any theory of the firm, of markets, or industrial organisation but rather as a supplement, an alternative to vertical integration for high-growth entrepreneurial firms (Thorelli, 1986; Larson, 1992). As commerce becomes more global, hypercompetitive and turbulent, both markets and hierarchies displayed inefficiencies as modes of organising production. Thus a network organisational form emerged that balanced the flexibility of markets with the predictability of traditional hierarchies (Borgatti and Foster, 2003).

### 3.2.2 Social capital theory

The research on social capital is relatively recent. Although the concept in its current form can be traced back to the first half of the 20<sup>th</sup> century, only in the last 20 years it has captured the attention of practitioners and scholars from different backgrounds. The lack of an agreed-upon and established definition of social capital (Woolcock, 2001), combined with its multidisciplinary appeal, has led to the spontaneous growth of different interpretations of the concept.

Social capital theory was initially developed by sociologists and based on two fundamental concepts: actors and actions. Over the last decades, the social capital theory has been increasingly used to explain economic actions. As a consequence, theories in social capital have taken two different directions (Coleman, 1988). In the literature of political science, sociology and anthropology, social capital generally refers to the set of norms, networks, and organisations through which people gain access to power and resources that are instrumental in enabling decision-making and policy formulations. Economists, on the other hand, focus

on the contribution of social capital to economic growth. At the microeconomic level, they view social capital primarily in terms of its ability to improve the market function. At the macroeconomic level, they consider how institutions, legal frameworks, and the government's role in the organisation of production affect macroeconomic performance.

The most famous and in some ways most narrowly defined concept of social capital is that of Putnam (Putnam, 1993; Putnam *et al.*, 1993). Putnam views social capital as a set of 'horizontal associations' among people who have an effect on the productivity of the community. These associations include 'networks of civic engagement' and 'social norms'. Two assumptions underlie this concept, the first is that networks and norms are empirically associated and second, that they have important economic consequences. In this definition the key feature of social capital is that it facilitates coordination and cooperation for the mutual benefit of the members of the association (Putnam, 1993).<sup>13</sup>

Coleman (1988) puts forth a second, broader concept of social capital. Coleman sees social capital as '*a variety of different entities, which have two elements in common: they all consist of some aspect of social structure, and they facilitate certain actions of actors—whether personal or corporate actors—within the structure.*' From the outset, this definition broadens the concept to include vertical as well as horizontal associations and the behaviour of other entities, such as firms.<sup>14</sup> In fact, this view of social capital captures not only social structures at large but the ensemble of norms governing interpersonal behaviour. This will be further discussed in the next subsection.

A third, still more encompassing view of social capital includes the social and political environment that enables norms to develop and shapes social structure. In addition to the largely informal horizontal relationships included in the first concept and the vertical hierarchical organisations in the second, this view encompasses formalised institutional relationships and structures, such as governments, political regimes, the rule of law, court systems and civil and political liberties.

Social capital is positioned alongside human and physical capital. Human capital refers to the experiences and capabilities of individuals (actors), and physical capital is embodied in observable assets, such as tools and machines. Social capital refers to the relations among actors, individuals, groups, or organisations. Social capital is not a part of human capital since it is not 'located' in the actor but in the relationship with other actors (Coleman, 1990). A single

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<sup>13</sup> While this concept of social capital was originally limited to associations having positive effects on development, it has recently been relaxed to include groups that may produce undesirable outcomes, such as rent-seekers (for instance, the Mafia in Southern Italy, and militias).

<sup>14</sup> This concept of social capital is closely related to the treatment of firms and other hierarchical organisations in institutional economics, which sees the organisation's purpose as minimising transaction costs (Williamson, 1985; Williamson, 1993b). Vertical associations are characterised by hierarchical relationships and uneven distribution of power among members.

actor does not possess exclusive ownership rights to social capital because when the partner withdraws from the relationship, the connection dissolves with the social capital involved (Burt, 1992). In other words, social capital is between actors and is shared by these actors. Field *et al.*, (2000) further explain the differences and relationships between human capital and social capital in terms of focus, measures, outcomes, and policy (see Table 3.1).

Uphoff (2000) distinguish social capital as two norms: 'structural' social capital and 'cognitive' social capital. Structural social capital refers to objective and observable social structures such as networks, associations and institutions; while cognitive social capital comprises more subjective and intangible elements such as attitudes and norms of behaviour, shared values, reciprocity, and trust. These two forms are related and interactive. Table 3.2 presents in contrasting ways the main terms associated with the two norms of social capital.

Social capital can also be observed based on the scope (at micro, meso and macro level) of its unit of observations (Grootaert and van Bastelaer, 2002). Social capital at micro level refers to the form of horizontal networks of individuals and the associated norms and values that underlie these networks. The meso level of social capital captures horizontal and vertical relations among groups (in other words, at a level situated between individuals and society as a whole) which have been illustrated by regional groupings of local associations. Social capital at macro level refers to the form of institutional and political environment that serves as a backdrop for all economic and social activities and the quality of governance arrangements.

The discussion of social capital according to the forms and scopes is illustrated in Figure 3.4, where specific concepts of structural and cognitive social capital are presented along a continuum from micro to macro dimensions. These various levels of social capital can complement each other, e.g. when national institutions provide an enabling environment

Table 3.1. The relationship between human capital and social capital.

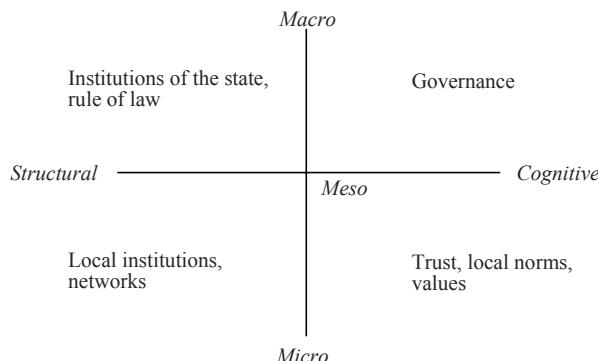
	<b>Human capital</b>	<b>Social capital</b>
Focus	Individual	Relationships
Measures	Duration	Membership/participation
	Qualifications	Trust levels
Outcomes	Direct: income, productivity	Social cohesion
	Indirect: health, civic activity	Economic achievement
		More social capital
Policy	Skill, accessibility, and rates of return	Citizenship, capacity-building and empowerment

Source: Adapted from Field *et al.*, (2000).

*Table 3.2. Complementary categories of social capital.*

	<b>Structural</b>	<b>Cognitive</b>
Sources and manifestations	Roles and rules Network and other interpersonal relationships Procedures and precedents	Norms, values, attitudes, beliefs
Domains	Social organisation	Civic culture
Dynamic factors	Horizontal and vertical linkages	Trust, solidarity, cooperation, generosity
Common elements	Expectations that lead to cooperative behaviour, which produces mutual benefits	

Source: Adapted from Uphoff (2000).



*Figure 3.4. The forms and scope of social capital.*

Source: Grootaert and van Bastelaer (2002).

in which local associations can develop. Communities in developing countries often rely on social pressure and reputation to enforce agreements between individuals and groups. When institutional development strengthens, local informal arrangements for dispute resolution become less relevant and may lead to the weakening of the social ties that support them. Hence a concept of social capital that encompass the micro, meso and macro dimensions will be better able to capture the counterbalancing effects of structures and attitudes in all levels of society (Grootaert and van Bastelaer, 2002).

Social capital is assuming an increasingly important role in poverty reduction strategies (World Bank, 2001; Grootaert and van Bastelaer, 2002). The World Bank recognised social capital as the core of empowerment agenda. Social capital is also a critical asset for creating opportunities for individuals that enhance well-being, achieve greater security and reduced vulnerability in social life and get a better performance with well-established buyer-seller relationships. Recently, social capital theory has been applied to explain buyer-seller relationships in chain and networks domains (Lazzarini *et al.*, 2001; Omta *et al.*, 2001). In the Chinese context, the concept of social capital has been applied in different ways. At the individual level, social capital provided insights into how people enhance their career success (Burt, 1992) and how people find nonfarm employment (Zhang and Li, 2003). At the firm level, social capital provides variable insights into the investment decisions (Batjargal and Liu, 2004) and performance of firms (Luo and Chen, 1997; Lee, 2001; Park and Luo, 2001).

### 3.2.3 Network relations as social capital

The social capital theory assumes that the behaviour and expectations of actors are constrained by the degree to which the relationship between the actors is embedded in the network structure. Network relations may enhance the 'social capital' of an individual or a company by making it feasible to get easier access to information, technical know-how, and financial support (Omta *et al.*, 2001). Uzzi (1996) analysed the network as an important source from which managers access information about opportunities and control over subordinates. Cross and Prusak (2002) found that to make effective decisions, managers rely on information from people within their network. Another example is the research of Krackhardt and Hanson (1993), who focused on informal networks as an information source. These networks can cut through formal reporting procedures to jump to long, slow-moving initiatives. All of these studies showed the relevance of social capital and information obtained from networks for controlling, monitoring and safeguarding. Granovetter (1985) used the term of '*embeddedness*' to explain how social relations affect the economic behaviour of actors and the institutional arrangements of supporting transactions. It should be mentioned that embeddedness in a network does not only evoke positive contribution to organisations, but also may have negative effects on organisation performance. The relationships may also lead to 'social liability', like limited opportunity to relate to firms outside the network, risk spill-over and high coordination costs of network relations. This was called '*overembeddedness*' (Uzzi, 1996). Uzzi (1996; 1997; 1999) proved this effect with the investigation of the American apparel and banking industry. Overembeddedness effects arise when firms over-rely on embedded ties and not arm-length relationships. Due to this, there are few non-redundant links to outside members who potentially could introduce new ideas into the network. The flow of new or innovative information into the network begins to decrease and is eventually closed off (Burt, 1992). Over time, isomorphic processes can also decrease network diversity and increase organisational inertia so that change is difficult and costly for network partners (Uzzi, 1996). In highly embedded networks, feelings of obligation, friendship or betrayal may also be so intense that emotions override economic imperatives. Thus they may devote

resources at a rate that exceeds their capacity to support themselves or may become governed by negative sentiments that misdirect organisational resources. Eventually either process leads to a network that is out of step with the environment and ultimately leads to organisational failure (Uzzi, 1996).

### **3.3 Transaction cost economics**

Transaction cost economics (TCE) is an approach to the study of economic systems and organisations. TCE is based on an integrated perspective of institutions, the law and economics (Rao, 2003). The classic contribution of Coase (1937) marked the beginning of the recognition of the role of transaction costs in the theory of the firms as well as its extensions to other forms of economic institutional governance. Coase's pioneer work in *The Nature of the Firm* provided an insight into the emergence of firms and markets with a clear focus on the role of exchange costs in the related interface. Coase began a revolution in economic and organisational theory by asking the question: *Why do firms exist?* The whole discussion focused on the competitive market theory, which posits the price system as a perfectly coordinating mechanism for goods and services provision.

The main approach of TCE is, as Williamson (1989) suggested, to assign attribute differentiated transactions to governance structures in a transaction-cost-minimising manner. Transaction cost was interpreted broadly as the '*comparative costs of planning, adapting, and monitoring task completion under alternative governance structures*'. In another perspective, North (1990) described these as '*the costs of measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreements*'. These definitions indicate the prior focus of TCE on the institutions and evolution of governance structures in relation to the role of transaction costs. In other words, TCE primarily focuses on the costs involved in making transactions rather than the costs of producing a product. TCE thus emphasises the elements that govern transactions. Here the term 'governance' is defined broadly as the 'mode of organising' (Williamson, 1991). Governance is viewed in terms of the design of the particular mechanisms supporting an economic transaction where there is an exchange of property rights. TCE tries to derive the optimal governance mechanism under a certain set of situational contingencies (Barney and Hesterly, 1999).

Bounded rationality, opportunism and asset specificity are identified as three main factors that lead to the existence of transaction costs (Williamson, 1985). First, bounded rationality means that while people intend to be rational; in reality their cognitive capabilities are limited. Among the reasons for bounded rationality are informational uncertainties and informational complexities. Second, opportunism refers to the behavioural aspect: '*self-interest seeking with guile*' (ibid. p.47). In other words, at least some individuals are inclined to be opportunistic or to act with self-interest. Contractual specifications are often inevitably incomplete relating to specific performance requirements of parties to the contract under various known and unknown contingencies. The incomplete contract's perspective lays the ground for the prevalence of

opportunism, both pre-contractual and post-contractual (Rao, 2003). Third, asset specificity refers to the extent to which non-fungible assets are tied to particular transactions specified by contracts or other forms of commitment. Assets are specific to a particular use if the 'returns' they provide are valuable only in that use, relative to any alternative use. The degree of asset specificity may be assessed in terms of the investment value that is lost when the asset is switched from its intended use to an alternative use (usually a less efficient and/or less valuable use). Based on these three assumptions, TCE explicitly considers the efficiency implications of adopting governance mechanisms in transactions.

According to TCE, business exchanges are aimed at attaining the lowest transaction costs. It compares alternative governance mechanisms, which can range from spot-market exchanges to vertical integration (See Figure 3.3). In the TCE framework, the costs of any transaction comprise the *ex ante* and *ex post* costs. *Ex ante* costs are incurred before and during the transactions, such as search costs, information costs, and the costs of negotiating and forming a contract or agreement. *Ex post* costs are the costs that rise after the transactions, such as the costs of monitoring and enforcing contracts or agreements (Williamson, 1996b). *Ex post* transaction costs, also known as 'coordination costs' among organisational theorists (Douma and Schreuder, 2002), are resources utilised for creation, including the maintenance, and the use of institutions and organisations (Furubotn and Richter, 2000). According to Williamson (1985), in the case of a high level collaboration, the buyer-seller relationship will be close to the vertical integration mode, whereas in cases of lower levels of collaboration, buyer-seller relationship will be close to the spot-market mode of governance.

Williamson (1985) identified three dimensions for TCE: transaction specific investments, uncertainty and frequency. The concept of transaction specific investments is the dimension most frequently used to determine the optimal governance mechanism for transactions<sup>15</sup>. Transaction specific investments are dedicated to a particular relationship and cannot easily be redeployed. The idiosyncratic nature of these assets gives rise to a safeguarding problem, and consequently a mechanism must be designed to minimise the risk of subsequent opportunistic behaviour (Anderson and Gerbing, 1988). Williamson (1996b) emphasises that transaction specific investments are so critical that they transform the nature of the exchange, rendering firms both valuable and vulnerable positions. Transaction specific investments allow for coordination of activities and exploitation of complimentary assets. They can create a situation in which the number of potential partners is small and a firm becomes dependent on its counterpart (Kemp, 1999). Due to the relatively high specificity of the assets, the firm

<sup>15</sup> The original TCE framework proposes that the choice of the governance mode can also be influenced by the uncertainty and frequency of the transaction. Since the study of buyer-seller relationships focuses on recurrent transactions (Van de Ven and Walker, 1984), and the uncertainty faced by the transactional partners within the same industry are typically alike (Klein *et al.*, 1990; Ganesan, 1994), transaction specific investments is the most critical dimension of a buyer-seller relationship in the context of our discussion. Additionally, more recent studies have pinpointed the transaction specific investments as the most critical dimension of a transaction (for a review see Rindfuss and Heide, 1997).

cannot rely on spot-market transactions. The high specificity requires close collaboration or, in extreme situations, even vertical integration.

There are various limitations to TCE theory. First of all, in a TCE framework, transactions are considered a phenomenon isolated from their environment. TCE focuses on a single transaction as the unit of analysis, while ignoring other relationships that surround the focal transaction (Cook and Emerson, 1978). Embeddedness of transactions will occur in a recurrent set of transactions in long-term buyer-seller relationships. The past interactions and anticipations on future transactions both influence how present transactions are organised. Secondly, TCE does not explicitly consider the dynamic evolution of governance mechanisms and transactions (Ring and Van de Ven, 1992). Thirdly, TCE can be challenged based on its idea that individuals are basically motivated by self-interest with guile (Powell, 1990; Barney and Hesterly, 1999). It seems that many forms of organisational interactions are based on the gradual development of trust, helping firms to lower the transaction costs relating to safeguards against opportunism (Anderson and Narus, 1999). Apart from calculative trust (Williamson, 1993a), TCE generally overlooks the implications of the affective and other features of trust (Rindfleisch and Heide, 1997; Barney and Hesterly, 1999). Aware of these limitations of TCE, scholars aim for a better understanding of buyer-seller relationships by considering relational governance. We will further discuss this in Section 3.4.2.

### **3.3.1 Governance in buyer-seller relationships**

Transaction cost economics (TCE) provides a comparative framework for assessing alternative governance forms involved in marketing channels (Williamson, 1996b). As discussed earlier, there are three critical dimensions that affect the choice of contractual arrangements to reduce transaction costs: transaction specific investments, uncertainty and frequency. According to Williamson, the following alignment of transactions with governance structures is made to minimise transaction costs (see Figure 3.5): market governance with classical contracts for non-specific transactions; trilateral governance with neo-classical contracts for occasional transactions of mixed and highly idiosyncratic nature; bilateral governance with relational contracting for recurring mixed idiosyncratic transactions; and unified governance with relational contracting for recurring highly-specific transactions (Williamson, 1979).

Spot markets (market governance) are assumed to coordinate demand and supply through price adjustment without specific investments. The spot market is characterised by spot transactions, one-time exchanges that seldom involve a future obligation (e.g. cash payment). Past and future interactions are not taken into account. Spot markets are the traditional form of vegetable transactions in China. Producers sell vegetables to consumers at the wet markets or deliver to traders and the wholesale markets based on instant transactions. No formal relationships exist among farmers, traders and consumers. Price and quantity are determined based on face to face negotiations.

		Investment characteristics		
		Non-specific	Mixed	Idiosyncratic
Frequency	Occasional	Market Governance (Classical contracting)	Trilateral Governance (Neo-classical contracting)	
	Recurrent		Bilateral Governance	Unified Governance (Relational Contracting)

Figure 3.5. Matching governance structures with commercial transactions.

Source: Williamson (1979).

Contractual transaction (neo-classical contracting) is defined as the occasional transactions conducted under written agreement between buyers and sellers with mixed or idiosyncratic specific investments (Williamson, 1979; FAO, 2001). Contracts are the preferred means of coordination under situations of high risk and uncertainties. Quality, quantity, transaction conditions, and rights and obligations are the major defined issues in a contract.

Relational transactions (bilateral and/or unified governance) are defined as recurrent transactions that are completed based on long-term relationships between two parties with mixed or idiosyncratic specific investments. Cooperation and mutual benefits are the major concerns in relational governance.

For a comprehensive understanding of the differences between the different forms of governance, we are going to discuss in detail the two major governance forms below, namely contractual governance and relational governance.

### 3.3.2 Contractual and relational governance

In this section, we will discuss the characteristics of contractual and relational governance, and study the interactions between them.

#### 3.3.2.1 Contractual governance

The role of contracts in business relationships has clear managerial implications (Lusch and Brown, 1996). Both transaction cost economics (TCE) and relational contracting theory

(RET, MacNeil, 1980)<sup>16</sup> are developed to complement classical contract theory (Cannon and Perreault Jr, 1999). In TCE, a contract between a buyer and a seller means specific transactions, agreements and promises, and the terms of the exchange are defined by price, asset specificity and safeguards, under the assumption that quantity, quality and duration are all specified (Williamson, 1996a). Contracts, franchise agreements and hostage taking are formal governance mechanisms in the TCE model (Uzzi, 1999). In RET, formal contracts represent promises or obligations to perform particular actions in the future (MacNeil, 1978).

The definition of a contract is based on buyer-seller transaction. However, TCE remains a 'unitime' model in which the reference point for adaptation is the original agreement, not the entire relation (MacNeil, 1978). In RET, the concept of a contract is expanded to refer to relationships between people who have exchanged, are exchanging or expect to exchange in the future (MacNeil, 2000). Moreover, RET describes a set of relational contracting norms, which are adaptations of the norms common to all contracts (MacNeil, 2000). Evidently, the popular and legal notion of contract is more compatible to the concept of contract in TCE than in RET. In general, legal agreements characterise the transaction end of the transactional-relational continuum, as opposed to ethical principles at the relational end (Gundlach and Murphy, 1993). To distinguish between TCE and RET approaches to contract, researchers have referred to contracts as hard and soft, explicit and normative, formal and informal, and written and unwritten (Heide, 1994; Lusch and Brown, 1996; Antia and Frazier, 2001). Hard, explicit, formal, and written contracts attempt presentation, or the bringing of an expected future into the present, with the underlying assumption of complete planning at a given point in time (MacNeil, 1978). In this study, we consider contractual governance synonymous with the terms of hard, explicit, formal, and written contracts. In this sense, contracts are detailed, binding legal agreements that specify the obligations and role of both parties. As such, contracts can be considered substitutes for the formal governance mechanisms of hierarchy or integration in business-to-business exchanges.

TCE scholars commonly point to three categories of exchange hazards that necessitate contractual safeguards (or vertical integration): asset specificity, measurement difficulty and uncertainty.

Asset specificity emerges when sourcing relationships require significant relationship-specific investments in physical and/or human assets. The presence of these specific assets transforms an exchange from a world of classical contracting in which the 'identity of parties is irrelevant' into a world of neoclassical contracting in which the identity of exchange partners is of

<sup>16</sup> MacNeil (1978) developed a formal typology of discrete versus relational exchange. Discrete exchange is consistent with the underlying assumptions of neoclassical economic theory, in which individual transactions are assumed to be independent of past or future relations between the contracting parties and constitute nothing more than the transfer of ownership of a product or service (MacNeil, 1980). Relational exchange, in contrast, explicitly accounts for the historical and social context in which recurrent transactions take place. It views enforcement of obligations as following from the mutuality of interests between a set of parties.

critical importance (Williamson, 1991). Severing the relationship results the loss of value of these specialised investments. To safeguard against such hold-up behaviour, managers adopt neoclassical contracts, which promote the longevity of relationships by specifying not only required actions and conditions of contractual breach, but also a framework for resolving unforeseen disputes. In practice, however, given that transaction specific investments are necessary, many transactions exist outside the realm of vertical integration or contracts (Bensaou and Anderson, 1999). One possible reason for this is that relationships based on trust lessen the chance that vertical integration is needed to protect transaction specific investments. An ongoing relationship generally fosters trust and enables partners to adopt more flexible models of cooperation (such as alliances), create value together (mutual benefits or reciprocity) and eventually, induce suppliers to make transaction specific investments.

Difficulty in measuring the performance of exchange partners also generates market hazards. When performance is difficult to measure, parties have incentives to limit their efforts towards fulfilling the agreement. Managers have two choices. They can either be content with a potentially lower performance because of their inability to measure performance or expend resources to improve performance measurement by creating more complex contracts that specify delivered service levels or facilitate the monitoring of a supplier's behaviour. For example, if the buyers are unable to measure the vegetable quality in an easy way, vegetable sellers might tend to deliver low quality vegetables without causing any loss because they will be treated as good quality vegetable suppliers anyway. To guarantee vegetable quality, the buyers prefer to sign a detailed contract with the sellers to formulate quality characteristics. As measurements become more complex, we therefore expect that buyers to develop more complex contracts, which enable them to accurately measure vegetable quality.

Uncertainty also challenges exchange by requiring the parties to adapt to problems raised from unforeseeable changes. The uncertainty may arise from rapidly changing technology, markets, consumer preferences, etc. In general, markets are a marvel at autonomous adaptation, particularly when prices serve as sufficient statistics to induce changes in supply and demand (Williamson, 1991). However, for more complex forms of adaptation that require coordination among parties, simple market governance is not adequate as it lacks coordinating capabilities. Contracts, however, give access to such capabilities through the specification of clauses and procedures that facilitate negotiations that invariably arise from technological changes.

High levels of uncertainty in conjunction with measurement difficulty or asset specificity render contracting even more hazardous (Williamson, 1985). High uncertainty, for instance, may discourage a supplier from making specialised asset investments if appropriate safeguards are absent. Similar reasoning applies to measurement difficulty. If the underlying technology is rapidly changing, difficulty in measuring the performance of the services rendered with the technology may stretch the limits of contracting. Thus firms may choose to vertically integrate or seek to alter the exchange with relational governance.

Formal contracts are mechanisms that attempt to reduce risk and uncertainty in exchange relationships (Lusch and Brown, 1996). However, Williamson (1975) noted that contracts are incomplete because of parties' inability to write an a priori comprehensive agreement that covers future contingencies. MacNeil (1980) recognised that the legal contract cannot explicitly state how potential situations will be handled in the future. It follows that strict adherence to the written contract may preclude the necessary flexibility in an exchange. An undue reliance on a formal contract signifies a transaction-oriented approach and an adversarial relationship (Gundlach and Achrol, 1993) and will suffer low exchange performance without a well-developed social relationship (Cannon *et al.*, 2000).

### **3.3.2.2 Relational governance**

Relational governance is an endogenous mechanism that can enhance exchange performance by embedding private and public information flows in a matrix of social ties rather than by resorting to contract or its enforcement by a third party such as courts (Uzzi, 1999). The reference point in relational governance is the set of relational norms that develops over time. Businesspeople often ignore the technically correct legal implications of contracts, which are often modified, supplemented or completely supplanted by the norms of the ongoing relationship (Macaulay, 1963). There is general agreement that norms describe appropriate behavioural guidelines that enforce social obligation in the exchange (Heide and John, 1992; Heide, 1994). Shared norms and values are the hallmark of relational exchange (Brown *et al.*, 2000), and they essentially develop through a socialisation process in which the parties understand and endorse each other's expectations. Norms therefore represent important social and organisational mechanisms for controlling the exchange (Gundlach and Achrol, 1993).

Relational governance has often been referred to '*relationalism*' (Noordewier *et al.*, 1990; Gundlach *et al.*, 1995; Antia and Frazier, 2001). It has also been termed as '*social embeddedness*' (Uzzi, 1999), '*informal self-enforcing governance*' (Dyer and Singh, 1998) and '*procedural governance coordination*' (Sobrero and Schrader, 1998). In marketing channel literature, researchers have assessed relational governance using operationalisation of MacNeil's (1980) relational contracting norms. The relational governance construct is viewed as multifaceted and can be described in a second-order confirmatory factor model (Noordewier *et al.*, 1990; Brown *et al.*, 2000). Explicit in its conceptualisation is the assumption that the lower order factors (relational norms) represent highly correlated, overlapping domains that can be combined to form a unidimensional exchange continuum (Cannon and Perreault Jr, 1999). As such, divergent manifestations of MacNeil's (1980) relational contracting norms are indicative of movement along the transactional-relational continuum (Kaufmann and Stern, 1992). The term '*relationship strength*' has also been used to express the degree to which relational norms are present in an exchange (Paulin *et al.*, 1997). Higher levels of relational governance are associated with more interactions between the parties and less emphasis on formal contract (Gundlach and Achrol, 1993).

Relational governance in this study makes reference to MacNeil's (1980) argument that any relational exchange relies heavily on social components – most frequently, trust. Sociologists have also demonstrated the embedded role that trust and other forms of social relationships play in economic transactions (Granovetter, 1985). This study defines relational governance as interfirm exchanges which include significant relationship-specific assets, combined with a high level of trust (Zaheer and Venkatraman, 1995). Relational governance mechanisms (such as trust) are regarded as a means to enhance transaction specific investments associated with less monitoring and bargaining (Barney and Hansen, 1994). Holm *et al.* (1996) argued that increased levels of understanding in a relationship will increase the overall commitment-level of the relationship. The existence of trust between two partners can help to facilitate collaboration (Claro *et al.*, 2003) and can help to create a stable and committed relationship.

Trust is a key feature of relational governance. The need for trust between partners has been identified as an essential element of buyer-seller relationships (Anderson and Narus, 1990; Morgan and Hunt, 1994; Geyskens *et al.*, 1998; Rousseau *et al.*, 1998). Trust is frequently considered to be the positive expectations one party has about another party's intentions. That is, trust is one party's confidence in another's good will (Zaheer and Venkatraman, 1995) or the shared belief that in the long run, rewards will be distributed fairly among the partners (Barney and Hansen, 1994). Broadly defined, trust reflects the extent to which negotiations are fair, commitments are sustained (Anderson and Narus, 1990) and the extent to which one party believes that its requirements will be fulfilled through future actions undertaken by the counterpart (Anderson and Weitz, 1989; Barney and Hansen, 1994). Nooteboom (2002) gave the following definition of trust: '*Trust in things or people entails the willingness to submit to the risk that they may fail us, with the expectation that they will not, or the neglect or lack of awareness of the possibility that they might.*'

### 3.3.2.3 The interaction of contractual and relational governance

Recently, researchers have become interested in the study of the relationships between contractual and relational governance (Popo and Zenger, 2002; Ferguson *et al.*, 2005; Yu *et al.*, 2006). The main objectives are subject to distinguish whether the two governances function as substitutes or complements. Academic research in economics and sociology has generally viewed relational governance and formal contracts as substitutes; the presence of one governance device (relational governance, in particular) obviates the need for the other (Macaulay, 1963; Larson, 1992; Gulati, 1995). In particular, trust reduces transaction costs by 'replacing contracts with handshakes' (Adler, 2001). Thus Dyer and Singh (1998) argue that informal self-enforcing agreements which rely on trust and reputation 'often supplant' the formal control characteristic of formal contracts. Gulati (1995) is quite explicit in arguing that contracts and trust function as substitutes:

*...trust avoids contracting costs, lowers the need for monitoring, and facilitates contractual adaptation. Trust counteracts fears of opportunistic behaviour and as a result, is likely to*

*limit the transaction costs associated with an exchange...In other words, trust can substitute for hierarchical contracts in many exchanges...'*

Similarly, Uzzi (1997) argues that the embeddedness of exchanges within social structures circumvents and thus economises on time otherwise spent in costly contract renegotiations. Finally, Larson (1992) argues that formal contracts are rather unimportant in the exchange agreements she examined. Informal social controls push these formal contracts to the background. A common underlying rationale for substitution emerges: if one party trusts the other, there is simply little need for contractually specifying actions. Relational governance moreover lowers transaction costs and facilitates adaptive responses.

Other scholars suggest an additional reason for substitution: formal contracts may actually undermine the formation of relational governance (Ghoshal and Moran, 1996). Macaulay (1963) contends '*Not only contracts and contract law are not needed in many situations, their use may have, or may be thought to have, undesirable consequences....Detailed negotiated contracts can get in the way of creating good exchange relationships between business units.*' Bernheim and Whinston (1998) develop a formal model and show that making contracts more explicit may encourage opportunistic behaviour surrounding actions that cannot be specified within contracts. In sum, these scholars view relational governance and formal contracts as substitutes, which operate through one of the two mechanisms. Either relational governance eliminates the need for formal contracts and vice versa, or formal contracts directly hinder the formation of relational governance.

Another group of scholars argue the complementary function of contractual and relational governance. In settings where hazards are severe, the combination of formal and informal safeguards may deliver greater exchange performance than either governance choice alone (Poppe and Zenger, 2002). The presence of clearly articulated contractual terms, remedies and processes of dispute resolution as well as relational norms of flexibility, solidarity, bilateralism, and continuance may inspire confidence to cooperate in interorganisational exchanges. The specification of contractual safeguards promotes expectations that the other party will behave cooperatively and thus complements the informal limits of relational governance. Cooperative behaviour in the present then reinforces an expectation of cooperation in the future. Long-term contracts are also explicitly drafted with provisions to promote the longevity of exchanges. Contracts that shift from merely specifying deliverable outcomes to providing frameworks for bilateral adjustments may facilitate the evolution of highly cooperative exchange relations. The process of contracting may itself promote expectations of cooperation consistent with relational governance.

The complementary relationship between relational governance and formal contracts may work in reverse as well. Relational governance becomes a necessary complement to the adaptive limits of contracts by fostering continuance and bilateralism when change and conflict arise (MacNeil, 1978). Relational governance ensures a 'keep on with it' attitude; each party desires

to and is able to depend on the other (MacNeil, 1980). Relational governance may also promote the refinement (and hence increased complexity) of formal contracts. Exchange experience, patterns of information sharing and evolving performance measurement and monitoring may all enable greater specificity (and complexity) in contractual provisions. As a consequence, relational exchanges may gradually develop more complex formal contracts, as mutually agreed upon processes become formalised.

### 3.4 Guanxi and guanxi networks

*Guanxi* as a social phenomenon in daily life is the hierarchically structured network of social relations in which people are embedded. *Guanxi* is commonly recognised as a special Chinese form of relational governance. We will discuss *guanxi* in comparison with social capital, network theory and relational governance.

*Guanxi* is a cultural and social concept in China. It basically refers to the existence of relationships between persons or things, the contact and connections between people, or relationships with particular people with whom one has a strong connection (Bian, 1994). For a better understanding of the concept of *guanxi*, some useful terms are defined here:

*Guanxi* is composed of two Chinese characters, *guan* (gate) and *xi* (connection). One must pass the gate to get connected to networks. As such, *guanxi* generally refers to relationships or social connections based on mutual interests and benefits (Yang, 1994). It is a special type of relationship that bonds the exchange partners through reciprocal obligations to obtain resources through a continual cooperation and exchange of favours (Davies *et al.*, 1995).

*Ganqing* refers to feelings and emotional attachment among members of networks. It is often an indicator of closeness of *guanxi*. The most intimate *ganqing* is the *qinqing*, which is a blood-based emotional attachment that only exists among direct family members. In a business relationship where no *qinqing* exists, one often does *ganqing touzi*, which means doing investment with affection to build a good *guanxi*.

*Xinyong* can be directly translated as ‘credit’. It is close to the Western version ‘trust’. Trust, in Chinese business relations, is based more on one’s credit or ability to return favours than on one’s integrity and competency, as in the Western relationship context.

*Renging* is a unique term in Chinese culture, often referring to one’s emotional responses when confronting various situations of daily life, a resource that one can present to another person as a gift in the social exchange process, and a set of social norms that one should follow to get along well with other people (Hwang, 1987).

The meaning and significance of *guanxi* in the social and business context are sophisticated (Wu, 1999). Researchers defined *guanxi* in different ways. *Guanxi* is commonly defined as special relationships two persons have with each other (Alston, 1989). Osland (1990) adds that it is '*...a special relationship between a person who needs something and a person who has the ability to give something*'. In other studies, *guanxi* is variously interpreted as particularistic ties (Jacobs, 1979), friendship (Pye, 1982), reciprocal exchange (Hwang, 1987), social capital (Butterfield, 1983), a cluster of exchange relationships for instrumental purposes (Walder, 1986), a web of extended family relationships (Kipnis, 1997), special relationships due to the existence of particularistic ties (Tsui *et al.*, 2000), particularistic relationships built simultaneously for the sake of the relationship and instrumental purposes (Lin, 2001), and the process of social interactions that initially involves two individuals (Fan, 2002).

The definition for *guanxi* has both static and dynamic aspects. For the static aspect, it can be defined as the *present* personal relationships or ties (Jacobs, 1982). For the dynamic aspect, it refers to *drawing* on connections or networks (Brunner *et al.*, 1989; Yeung and Tung, 1996; Luo and Chen, 1997). Some definitions also combine the static and dynamic aspects of *guanxi*. It recognises *guanxi* as a set of relations formed for certain kinds of activities (Hwang, 1987; Pye, 1992; Yang, 1994; Ralston *et al.*, 1995).

*Guanxi* can be generally classified into three categories: 'family', 'friend' and 'business' *guanxi*. Family *guanxi* and friend *guanxi* are similar to what Hwang's terms 'expressive ties' and 'instrumental ties' (Fan, 2002). The expressive tie is generally a relatively permanent and stable social relationship. Expressive ties occur mostly among members of such primary groups as family, close friends, and other congenial groups. Expressive ties are governed by the need rule for the social exchange and resource distribution within a family (Hwang, 1987). The instrumental ties are rather stable and long-term relationships as a means or an instrument to attain material goals from other people outside the family. Instrumental relationship follows the equity rule in Chinese culture (Hwang, 1987). Business *guanxi* is defined as the process of finding business (rather than personal) solutions through personal connections (Fan, 2002). It is dynamic, and certain social *guanxi* is transferable (Standiford and Marshall, 2000). The development of individual links ultimately leads to a multilayer relationship network which is usually called '*guanxi* networks'.

Integrating all these aspects, the current study defines *guanxi* as '*a web of personal connections based on existing or acquired particular ties that people can use to obtain resources or other advantages through tactical continual exchanges of favours*'. This definition takes into account different aspects of the nature of *guanxi*. First, *guanxi* is set up on a set of pre-existing or acquired particular ties which is called the *guanxi* base by Jacobs (1979). Second, the underlying ties of the relationship can be utilised through activities that are based on some particular norms which are called the art of *guanxi* (Yang, 1994). Third, the accumulation of *guanxi* bases and the practices of *guanxi* tactics can lead to substantial rewards, which are called the benefits of *guanxi* (Davies *et al.*, 1995).

Empirical research on *guanxi* has shown significant effects on different outcome variables. A *guanxi* network promotes interpersonal trust (Farh *et al.*, 1998), encourages trust-based exchanges (Hill, 1995), facilitates job mobility (Bian, 1997; Zhang and Li, 2003), moderates investment behaviour (Batjargal and Liu, 2004), and enhances firm performance (Luo and Chen, 1997; Peng and Luo, 2000). The transaction cost advantage of *guanxi*-based exchange specifically lies in the way *guanxi* deals with governance problems associated with bounded rationality and opportunism. Thus a well-developed *guanxi* network in China can assist that firms carry out asset specific value chain activities (Standifird and Marshall, 2000).

### 3.4.1 *Guanxi* , social networks and social capital theory

Social capital theory postulates that transactions between economic actors are essentially social in their core features (Batjargal and Liu, 2004). Economic actors, i.e., individuals, groups, and organisations, are embedded and nurtured in webs of social relationships (Granovetter, 1985). As social capitalists, they capitalise on resources and assets located in social networks for instrumental actions (Lin, 2001). The idea of social capital in the Chinese context captures the indigenous social phenomenon of *guanxi*.

A social network is defined as '*a set of nodes (e.g. persons, organisations) linked by a set of social relationships (e.g. friendship, transfer of funds, overlapping membership) of the specified type*' (Laumann *et al.*, 1978, p.458). The basic analysis unit of social networks is the relational tie among different individual actors. These ties can be kinship and descent relations (Schweizer and White, 1997), sentiment relations (Hallinan, 1974) or instrumental relations (Granovetter, 1973). They serve as channels for transfer or 'flow' of resources and sources of opportunities and constraints to the action of individuals (Wasserman and Faust, 1994). Members of the social network are found to use various networking strategies to enhance their self-interests through the relationship they have (Galaskiewicz, 1979). Furthermore, empirical studies have revealed that businessmen play active roles in social network activities (Ibarra, 1993, 1995; Carroll and Teo, 1996) and, in this way, have a wide range of benefits such as access to information (Burt, 1992), preference treatment (DiMaggio, 1992), career development and nonfarm employment (Kram and Isabella, 1985; Zhang and Li, 2003).

As we mentioned earlier, *guanxi* generates significant positive benefits to the individuals and organisations connected in it. The benefits of *guanxi* refer to the possible supports that people achieve through their *guanxi* networks. In the Western context, such supports are recognised as social capital (e.g. Jacobs, 1961; Loury, 1977), referring to resources embedded in interpersonal relationships that produce opportunities to generate profit. Based on Lin *et al.* (1981), the value of one's social capital is closely related to the size of her/his social network as well as the status of its players. Research has found that social capital is highly productive in a large variety of actions that range from an individual's occupational attainment (Lin and Dumin, 1986; De Graaf and Flap, 1988; Marsden and Hurlbret, 1988) and to a firm's business success (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998). The gains generated from

the social capital in the west are just as important as the benefits achieved through *guanxi* networks in a Chinese context.

### **3.4.2 Guanxi and relational governance**

The importance of forming and maintaining collaborative buyer-seller relationships has received increasing attention over the last decade in western countries. *Guanxi* is widely recognised as the Chinese version of relational governance or relationship marketing (Arias, 1998; Wong, 1998; Yau *et al.*, 2000; Wong and Leung, 2001).

Although relational governance is experienced as useful in explaining marketing behaviour in the western world, the contribution and implementation of relational governance in oriental society, especially in China, one of the biggest countries in the world, is rather different from the western perspectives. The uniqueness of Chinese culture makes the direct transfer of western relational governance principles into China questionable.

Simmons and Munich (1996) studied the concept of relational governance and *guanxi* with a culture bound. They concluded that the relationships in China and the United States are dramatically different. Arias (1998) found that there are some important commonalities between *guanxi* and relational governance. Both of them have to do with managing relationships, networks and interactions. However, *guanxi* is essentially a cultural construct with a particular value in doing business under specific structural, legal, institutional, political and economic conditions. Arias also concluded that *guanxi* is a prerequisite to a business relationship. The establishment and management of networks (business and personal) is a means to delivering a whole solution to the customer by pulling resources from a variety of actors.

Geddie *et al.* (2005) focus on constructs to distinguish the two concepts of *guanxi* and relational governance. They reviewed 77 articles on the subject of *guanxi* and relational governance (relationship marketing) and identified six popularly used constructs that are widely applied to both *guanxi* and relational governance. Among them, four constructs, namely bonding, empathy, reciprocity, and trust, are closely associated with *guanxi*, while the other two constructs including satisfaction and customer loyalty are commonly used in relational governance. They also distinguish *guanxi* and relational governance based on the time of relationship building and the time of transactions. *Guanxi* and relational governance are both about relationships. They both look for the development of satisfaction, trust, and commitment to establish future intentions of the customers. But the two practices are not exactly the same. The basis of the relationship in relational governance is satisfactory transactions; in *guanxi*, however, the relationship is built no matter if there are or are not transactions. Furthermore, *guanxi* concentrates on building the bond or relationship before the transaction in such a way that once the transaction is completed, the sellers and buyers become one cooperative unit. In contrast, relational governance deals with the transaction first

and builds the relationship later. If the relationships are not so strong, the buyers are seen as more of a subset than a merged partner (see Figure 3.6).

Wang (2007) explores the underlying mechanism between western relational governance and Chinese *guanxi* by examining the construct equivalence of the two concepts. He concluded that the underlying mechanism of relational governance is different from that of *guanxi*. Guiding principles of a relational exchange in most western cultures are driven by legality and rules, whereas guiding principles of relational behaviours in *guanxi* are driven more by morality and social norms (Arias, 1998). Relational governance is mostly at the organisation level (Morgan and Hunt, 1994); whereas *guanxi* works at a personal level on the basis of friendship, and *ganqing* is the measure of the level of emotional commitment and the closeness of the parties involved (Wang, 2007). Relational governance has a universalistic nature in that the network is relatively open to any exchange partners as long as one plays by the rule of the game; whereas *guanxi* is highly network-specific and does not generalise to members of other social networks.

Trust, along with commitment, is regarded as a fundamental building block of a relationship model (Garbarino and Johnson, 1999). Trust also functions differently in relational governance

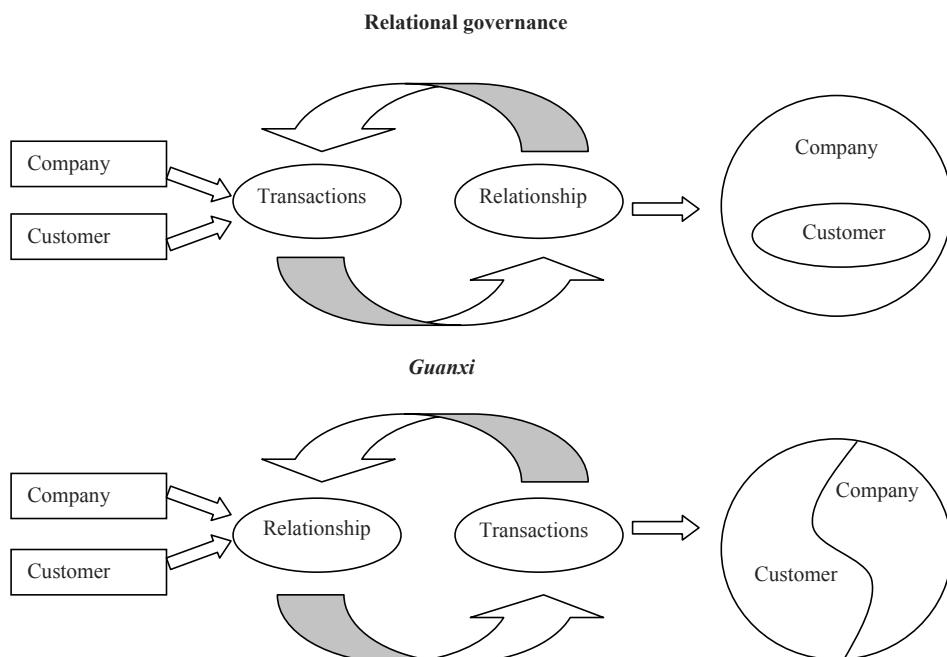


Figure 3.6. Comparison of relational governance and *guanxi*.

Source: Geddie et al. (2002).

and *guanxi*. Trust is a key factor in determining long-term orientation. Credibility and benevolence are two essential elements of trust. Whereas *xinyong*, building upon a person's past history and reputation to keep his/her promise to fulfil his/her obligation, guides relational exchange behaviour in *guanxi*. *Renqing*, including reciprocity and empathy, is key to maintain *guanxi*. There are significant differences between relational governance and *guanxi* from several aspects (see Table 3.3).

Similarly, Yau *et al.* (2000) identify four dimensions of relational governance in China, namely bonding, reciprocity, trust, and empathy. They compared these four dimensions for relational governance and *guanxi* (see Table 3.4).

In sum, *guanxi* shares some common characteristics with relational governance such as mutual understanding, cooperative behaviour and long-term orientation, but *guanxi* is culturally specific to China and thus should be treated differently when we study the role of *guanxi* in buyer-seller relationships and how it contributed to chain performance.

*Table 3.3. Comparison of relational governance and guanxi.*

	<b>Relational governance</b>	<b>Guanxi</b>
The context of promise	An economic nature concerning goods, services, etc; explicit; measure consumers' expectations and levels of satisfaction	A fundamental social nature; implicit; reciprocal personal favours, mutual protection and enhancement of reputation and social status
Timeframe of promise to be fulfilled	Have a well defined deadline to be fulfilled	Guanxi network favours are banked and create an obligation of reciprocity. Unbalanced relationships
The importance of trust development	Trust to enhance the contractual arrangement	Higher importance of trust due to structural and cultural reasons: trust is a supplement of contractual arrangement, lack of commercial law
Network integration	A strategic rational to building business networks. Partnership and networks are necessary to manage the whole service process	Rather limited role. Resources source, such as information on market trends, government policies, regulations and business opportunities, licenses, etc.

Source: Adapted from Garbarino and Johnson (1999).

Table 3.4. Comparison of the four dimensions of relational governance and guanxi.

	<b>Relational governance</b>	<b>Guanxi</b>
Bonding	Between consumer and supplier For a desired goal	Blood bases and social bases For social control and business behaviour
Reciprocity	Expect value to be returned in short-term With specific intention Converged value	Value returned at time both giver and recipients will benefit No specific intention Increased value
Trust	People with promised integrity Build transaction first, relationship may follow Based more on the system	Kinship or in-group members Build trust first, transaction may follow Based more on personal contracts
Empathy	Sender-centred communication	Receiver-centred communication

Source: Adapted from Yau *et al.* (2000).

### 3.5 Performance in buyer-seller relationships

Research on performance of business relationships has proven arduous in organisational studies (Taweesak, 2002; Claro, 2004). It is even harder to measure the performance at the supply chain level (Van der Vorst, 2000). Based on the investigation on the integrated market channel networks as shown in Figure 2.3, we are able to measure the performance for each bilateral buyer-seller relationship at different stages for different chain actors (such as farmer → buyer, buyer → customer). By doing this, we can describe the performance for the entire supply chain.

Various studies have developed performance indicators. However, their definitions and evaluations are numerous, and only few definitions and indicators are widely accepted. Performance evaluation of a buyer-seller relationship is problematic because each partner is likely to adopt idiosyncratic performance criteria which might even be conflicting. Moreover, performance measures change over time as the relationship evolves.

Traditionally, performance measurement is defined as the process of quantifying effectiveness and efficiency of action (Neely *et al.*, 1995). In the literature of performance, much attention has been devoted to three main streams: financial, organisational and strategic (Gunasekaran *et al.*, 2001). In the financial stream, accounting-based (financial) indicators of performance are most popular among researchers. Efficiency, growth, and profit are popular dimensions in this stream (Murphy *et al.*, 1996; Taweesak, 2002). In organisational stream, three fundamental

theoretical approaches (goal-based approach, system approach, and multiple constituency approach) have been evolved to measure organisational effectiveness. The goal based approach suggests that firms should be evaluated by the goals that they set for them. However, firms have various and sometime contradictory goals. The system approach partially compensates for the weakness of the goal-based approach by considering the simultaneous attainment of multiple, generic performance aspects. Nevertheless, both approaches fail to take into account the fact that different stakeholders might have different perspectives on performance. The multiple constituency approach examines the extent to which the various stakeholder groups' interests are satisfied. Strategic research integrates these three organisation theoretic perspectives, discussing organisational performance measurement in terms of multiple constructs, such as financial, operational, and multiple constituencies (Venkatraman and Ramanujam, 1986).

Both objective and subjective performance measures are commonly used for buyer-seller relationships and supply chain management (Venkatraman and Ramanujam, 1986). The objective performance measures can be collected without directly asking people (e.g. profitability). However, it shows difficulties in terms of cross-comparison, sensitivity and completeness (Scholten, 2006). Subjective performance measures, on the other hand, are collected by asking people to give their evaluation of certain criteria (e.g. satisfaction). It also has potential problems when the respondent fills out a questionnaire that may influence the respondent's opinion on a subjective measure and consequently affects its validity and reliability (Scholten, 2006).

Financial and non-financial measures are applied for performance measurement. Financial performance measures are dominant in empirical research (Murphy *et al.*, 1996). Murphy *et al.* argued that multiple dimensions of performance should be considered where possible, including both financial and non-financial measures. Efficiency and profit are the most commonly used accounting-based performance indicators (Murphy *et al.*, 1996). In addition, it is important to examine non-financial performance measures, such as product quality, satisfaction, and market share. These indicators of a firm's non-financial effectiveness are what ultimately lead to financial performance. Thus by examining both dimensions, research can arrive at an accurate estimate of the future performance of an organisation.

### **3.6 Concluding remarks**

This chapter discussed the social, organisational and economic theories which are widely studied in buyer-seller relationship literature. We discussed in detail the following theories: supply chain management, social capital theory and transaction cost economics. Each of them has its own focus, assumptions, and frameworks for the study of buyer-seller relationships. Meanwhile, they provide complementary explanations for such relationships.

The literature on buyer-seller relationships in general emphasises the importance of managing a relationship between partners (Ring and Van de Ven, 1992). Although there are a lot of studies

on certain aspects of buyer-seller relationships (e.g. the relation between trust and transaction specific investments), up to date, there has been a lack of a framework that integrates theories on relationship management and network theory, wherein several concepts are combined and systematically tested (Claro, 2004). This study tries to combine these concepts into one theoretical framework and empirically tests that framework by means of qualitative and quantitative research. The next chapter (Chapter 4) will discuss the integrated research model and define related propositions. Thereafter, qualitative and quantitative test of the research model will be performed in Chapter 6 and 7.



# Chapter 4 Research model and propositions

This study addresses two research questions: '*Do guanxi networks improve the integration of buyer-seller relationships and ultimately, market performance in vegetable supply chains in China?*' and '*Is there any difference in the use and the effect of guanxi networks in upstream and downstream buyer-seller relationships and traditional and modern high-value market outlets?*' In order to answer these questions, we proposed a conceptual research model (see Figure 1.1). In this chapter, we discuss buyer-seller relationships and *guanxi* in vegetable supply chains in China in Section 4.1. Thereafter, we explain how the conceptual model is developed. Based on the conceptual model, we formulate a research model with specific constructs related to *guanxi* networks, buyer-seller relationships and market performance. We explain how these constructs are connected to each other from a theoretical perspective (supply chain management, social capital theory and transaction cost economics) in Section 4.2. In Section 4.3 and Section 4.4, several propositions are defined regarding the interrelations among the concepts of *guanxi* networks, buyer-seller relationships and market performance. This chapter ends with some concluding remarks.

## 4.1 Buyer-seller relationships in vegetable supply chains

Buyer-seller relationships and the use of *guanxi* in vegetable production and marketing are different across channels and over time. In this section, the types and forms of buyer-seller relationships in Chinese vegetable supply chains are discussed. Zhang *et al.* (2004) made a distinction between buyer-seller relationships based on four different types of vegetable supply chains in China: controlled supply chains, disjointed supply chains, cooperation supply chains, and collaboration supply chains (see Figure 4.1). Chinese vegetable supply chains are evolving towards more complexity and therefore, become more difficult to manage.

Since the economic reform initiated in 1978, the majority of vegetable production and marketing were carried out by individual farmers and traders at the wet markets and wholesale markets. Since then, farmers have started to contact potential vegetable buyers to market their vegetables. At that time, most of the vegetables were sold directly to consumers through nearby local markets. Private traders, transporters and wholesalers appeared and soon became active players in vegetable distribution, since they were familiar with the sector and had extensive social networks. Their objectives were maximising profits. Most marketing activities were carried out in a traditional way at the wet markets and wholesale markets. Vegetable processing companies were emerging but faced financial constraints. Cash-and-carry dominated the vegetable transactions with arm-length relationships.

With the development of domestic vegetable markets and the fast integration into international markets, the Chinese vegetable sector has become very important. Private exporters and

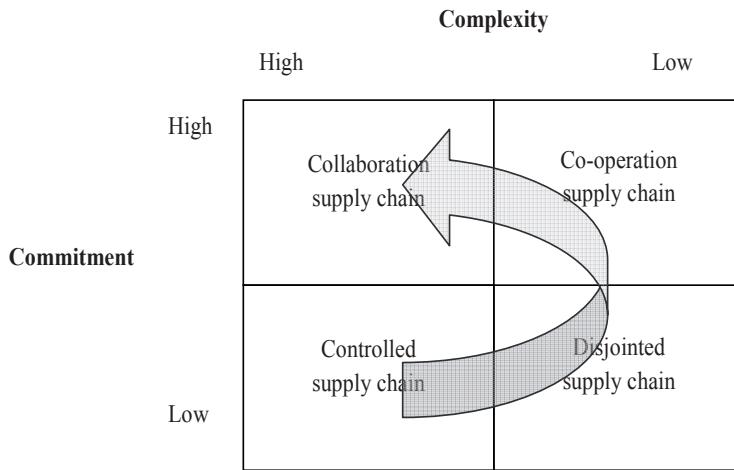


Figure 4.1. The development of buyer-seller relationships in the chain.

Source: Adapted from Zhang et al. (2004).

processing companies grow rapidly due to the reform of trade policies<sup>17</sup>. Vegetable marketing faces strong competition at both domestic markets and international markets. Compared with short-term profits, commitment and long-term business relationships become more important for market players. Quality and safety concerns further enhance relationship building and cooperation in vegetable production and marketing. Recently, the rapid rising of supermarkets in Asia, including China, has tremendously affected vegetable supply chains (Reardon *et al.*, 2003; Hu *et al.*, 2004). Contract farming appears in some areas, and chain integration occurs for some supermarkets and for processing companies. Buyer-seller relationships influence marketing behaviours for both sellers and buyers. Benefiting from personal networks, farmers get access to valuable marketing information and participate in high-value market outlets. Thus farmers can build up solid business relationships for long-term business transactions. Buyers' long-term relationships, on the other hand, benefit stable suppliers and loyal customers.

Trust and personal relationships (*guanxi*) appear to be an informal norm or mechanism that enforces formal or informal contracting relationships (Schramm and Taube, 2002, 2003). The importance of trust is witnessed in cooperation in vegetable supply chains. Chinese business philosophy is that people do business with trusted friends. Businessmen normally start to make friends and then look for business opportunities. Buyer-seller relationships based on *guanxi* will be further improved and enhanced with personal *guanxi* networks.

<sup>17</sup> One significant policy change is that private enterprises (processing and exporting companies) have more rights and fewer restrictions in doing international business with 'Self-Administrative Import-Export Certificate' obtained from the government. With this certificate, the processing and exporting companies are able to do international business directly. Furthermore, Chinese government provide support for agricultural processing companies in terms of technology improvement and marketing access.

Further development of relationship building and information sharing requires collaboration in the chains, and trust and commitment of both sellers and buyers. Chain collaboration mostly takes place in export-oriented regions, such as Shandong and Jiangsu Provinces, where partners in the chains are highly committed and products are jointly developed in order to export safe vegetables to international markets. A reliable and committed partnership is considered to be of strategic importance for business success. Vegetable supply chains in China are therefore developing towards more collaborative supply chains.

## 4.2 Research model

In Chapter 3, we discussed the social, organisational and economic theories that are widely addressed in the literature of buyer-seller relationships. We concluded that different theories (supply chain management, social capital theory and transaction cost economics) complementarily contribute to the study of buyer-seller relationships. We argued that an integrated research model taking into account different theories is required to test the effects of buyer-seller relationships on market performance. We therefore develop an integrated research model for the empirical analysis (see Figure 4.2).

As discussed in Section 3.4.1, the Chinese social phenomenon, *guanxi*, shares common features with social capital and social networks. *Guanxi* in social life and business is useful to obtain valuable information via direct and/or indirect personal connections within social networks. Social capital focuses on the relations among individuals, groups or organisations. Research on social capital has particularly focused on specific social relations, which provided more social capital and led to higher performance (Scholten, 2006). Networks, however, have often been

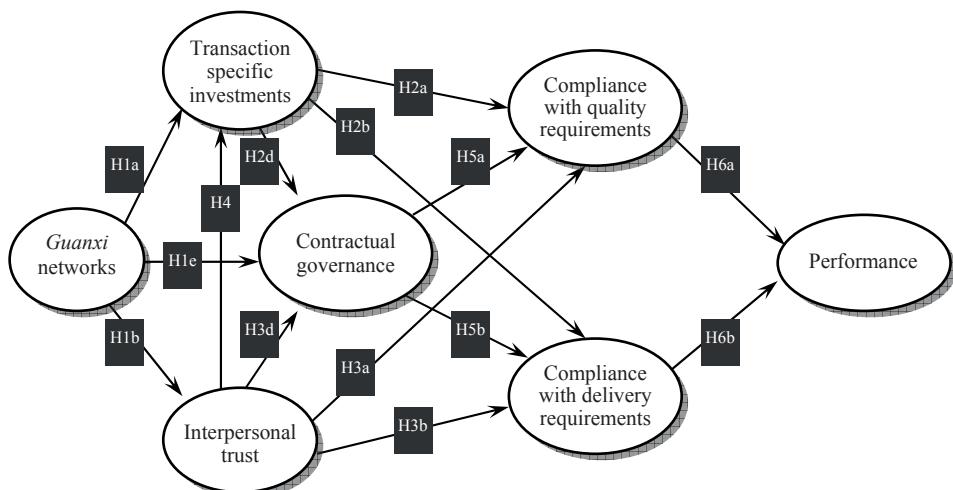


Figure 4.2. Empirical research model with defined propositions.

studied in a setting of bilateral governance (e.g. Larson, 1992), where trust and transaction specific investments are expected from parties involved in buyer-seller relationships.

Theoretical literature suggested that building strong *guanxi* relations with the right person is crucial to attain long-term business success in China (Yeung and Tung 1996). The literature also indicated that the effects of *guanxi* networks are related to several attributes, such as trust, uncertainty and dependency on a buyer-seller relationship (Wong and Leung 2001). Empirical evidence suggested that *guanxi* has significant effects on different outcome variables. *Guanxi* networks promote interpersonal trust (Farh *et al.*, 1998), encourage trust-based exchanges (Hill, 1995), facilitate job mobility (Bian, 1997; Zhang and Li, 2003), moderate investment behaviour (Batjargal and Liu, 2004), and enhance firm performance (Luo and Chen, 1997; Peng and Luo, 2000).

From a transaction cost economics perspective, *guanxi*-based exchanges take advantage of the way *guanxi* deals with governance problems associated with bounded rationality and opportunism (Standifird and Marshall, 2000). In this regard, *guanxi* networks assist farmers and companies to carry out asset specific activities.

How to manage a relationship between partners is the focus of the literature on buyer-seller relationships (Ring and Van de Ven, 1992; Claro, 2004). Different aspects of buyer-seller relationships have been studied. Claro (2004) studied how information obtained from the network influences trust, transaction specific investments and collaboration in the Dutch potted plant and flower industry. He concluded that business networks directly and indirectly affect buyer-seller relationships and market performance. Yu *et al.* (2006) examined the interrelation between formal contract, trust and transaction specific investments. They found that both formal governance and relational governance mechanisms affect the suppliers' tendencies to make specialised investments. They also found that (calculative) trust acts as a moderating factor in the relationship between formal governance mechanisms and transaction specific investments. Paulin *et al.* (1997) investigated how relational norms influence purchasing behaviour. Joshi and Stump (1999) discovered that the choice of relational governance is determined by two factors: high collaborative belief and rich supplier knowledge in a dynamic environment. Some researchers studied how relational and contractual governance interacted and how they influence market behaviour (Sharma and Pillai, 2003; Styles and Ambler, 2003; Yu *et al.*, 2006). Studies were also carried out to examine the determinants affecting performance. Claro *et al.* (2003) and Claro and Omta (2005) analysed how buyer-seller relationships and relational governance affect business performance; Ferguson *et al.* (2005) investigated the effects of both contractual and relational governance mechanisms on performance; and Sako (1998) and Masuku and Kirsten (2003) examined how trust affects business performance from a supply chain management perspective.

Based on the theoretical discussion and the existing literature, we identify interpersonal trust, transaction specific investments and governance mechanisms as the most important concepts

in buyer-seller relationships. We also investigate how *guanxi* networks affect buyer-seller relationships and how buyer-seller relationships affect market performance. These, in turn, become the first research question of this study.

### 4.3 Impact of *guanxi* networks on buyer-seller relationships

The propositions regarding the effects of *guanxi* networks on the three key elements of buyer-seller relationships, transaction specific investments, interpersonal trust and contractual governance, represent the left side of the research model in Figure 4.2.

#### 4.3.1 *Guanxi* networks and transaction specific investments

*Guanxi* is more than the exchange of gifts in order to procure favourable business transactions (Standifird and Marshall, 2000). The development of personal links ultimately leads to a multilayer network of relationships (*guanxi* network). The transferability of *guanxi* leads to a means to screen potential partners. The flexible and social nature of *guanxi* permits the members of a *guanxi* network to deal with unforeseen contingencies arising after agreements are reached. Thus *guanxi* possesses the capacity to reduce transaction costs associated with environmental uncertainties (i.e. communicating, negotiating and coordinating transactions) and behavioural uncertainties (i.e. opportunism). The transaction costs associated with *guanxi* networks have been shown to decrease as network size and scope of activities increase (Standifird and Marshall, 2000).

Transaction specific investments (TSI) refer to the degree to which an asset cannot be redeployed to alternative uses and by alternative users without sacrifice of productive value (Williamson, 1991). Such investments go beyond the boundaries of the firm and are aimed at exploiting efficiencies of coordination of activities between parties. Consider the example of a vegetable farmer or firm who implements new quality standards for a specific buyer (e.g. a supermarket). The new quality standards might require new knowledge about production techniques, handling processes and packaging facilities. Based on the request of the buyer, the farmer or the firm might need to invest in learning new farming techniques, purchasing equipment and developing new internal handling processes, all of which are specially tailored to meet the buyers' requirements (Dyer, 1996).

There are various advantages of investing in specific assets, especially in business relationships that encompass recurrent transactions (Claro, 2004). TSI made by farmers stimulate and cement long-term relationships with buyers. Such investments promote relational exchanges and increase the commitment between partners (c.f. Blau, 1964; Cook and Emerson, 1978). However, TSI also create dependency and incorporate risk of opportunism. High level of TSI leads to increased costs of replacing an exchange partner (Barney and Ouchi, 1986), thus it is negatively related to the chain member's autonomy. Furthermore, parties in a business relationship in which there is information asymmetry have disparate sets of information,

making it difficult for them to estimate the true value of TSI. This subjects a firm to significant threats of opportunism and dependency. One way to protect against these threats in China is to rely on personal *guanxi* networks. *Guanxi* networks do not incur costs of documentation or arbitration which are associated with other governance forms. From a safeguarding perspective, *guanxi* networks can deal with an increased level of asset specificity (Standifird and Marshall, 2000). The information and assistance gained from *guanxi* networks function as a mechanism for reducing information incompleteness and opportunistic behaviour. In other words, in the process of business transactions, you consult via your *guanxi* networks (such as friends, other business partners or other personal relations) to know in advance if the potential business partners are honest and creditable; you may also find out if they are really the right person to do business with. Relying on *guanxi* networks, you will be more confident in investing specific assets. As the Chinese *Sun Tzu* 'The Art of War' told us '*know yourself, know your enemy, and you can fight a hundred battles with no danger of defeat*' (online source: <http://www.answers.com/topic/the-art-of-war>. Access date: February 22, 2007). Thus a positive impact of *guanxi* networks on TSI can be expected. We formulate our first proposition:

*H1a: The more support a seller or a buyer achieves from his guanxi network, the more this seller or this buyer is likely to invest in transaction specific investments.*

#### **4.3.2 Guanxi networks and trust**

*Guanxi* networks are likely to promote trust in buyer-seller relationships. Connections via *guanxi* networks encourage the sellers and the buyers to trust the contacted person. *Guanxi* is comprised of personal based relationships, thus *guanxi* networks are individual rather than organisational based relations. *Guanxi* networks influence trust in different ways.

First, *guanxi* networks provide assurance against the exchange partners' unexpected behaviour and market uncertainties (Uzzi, 1996; Standifird and Marshall, 2000). In a *guanxi* network, the cost of opportunism is not only the loss of transaction opportunities with the transaction partner, but also the loss of exchange opportunities with all other members in this *guanxi* network. *Guanxi* networks also foster common beliefs and values among member firms, generating common goals and mutual benefits. Therefore, the more developed the *guanxi* networks (more connections within *guanxi* networks and more support obtained from *guanxi* networks), the greater the assurance that the exchange partners in the *guanxi* networks will not act opportunistically.

Second, the social structure in *guanxi* networks stimulates trust (Thorelli, 1986). Strong personal relationships lead to the generation of relationship-sustaining factors such as trust and commitment. Firms acting in a positive atmosphere are more inclined to trust. When a transaction is made with a firm of known reputation and capabilities, there is an associated implication that social bonds will guard against trouble (Thorelli, 1986). Moreover, the attitude of a firm within one relationship is connected to the other relations. Inevitably a

firm compares the trust that developed in one relationship with that in connections involving other firms in the network and their relationships. For instance, Uzzi (1996) found that trust between a supplier and its main buyer is affected by the strength of the buyer's bonds with the connected key customer. This is certainly the case in China as *guanxi* is transferable within networks. A firm with strong *guanxi* networks is more reliable and thus can be trusted more.

Third, network members may act as a referral for a given counterpart, since it might be the same counterpart with whom they are dealing (Burt, 2001). For example, through relations with friends, vegetable farmers may obtain valuable information to monitor the actions of buyers, since the friends are likely to be dealing with the same buyer. Therefore a well-developed *guanxi* network increases the ability to access to information about a buyer's action, which eventually supports the development and continuance of trust. Thus the second proposition is defined as follows:

*H1b: The more support a seller or a buyer achieves from his guanxi network, the more this seller or this buyer is likely to trust his counterpart.*

Empirical evidence indicated that the sellers and buyers that occupy different positions in buyer-seller relationships behave differently (Claro, 2004). This should also be the case in different market channels since the business environment is more diversified in different channels compared to that in different buyer-seller relationships. In the *guanxi* rooted society of China, the sellers and buyers may use their *guanxi* networks differently. *Guanxi* may prevail more in traditional market channels compared to that in modern channels (e.g. international markets). This may also be the case in different business relationships. In a buyer dominated market, vegetable farmers and processing and exporting companies face severe difficulties in selling their products (in relationships with downstream partners), such as poor market access, unavailable buyers and low prices. Thus it is reasonable and important to rely on their personal *guanxi* networks to overcome such problems. Vegetable buyers (such as supermarkets and processing and exporting companies), on the other hand, face less difficulties in buying high-quality vegetables from the market. They have many alternative sources. Compared to the sellers, *guanxi* networks are less required by the buyers. The buyers tend to rely less on their *guanxi* networks in vegetable purchasing activities. Thus we formulate the following propositions:

*H1c: Guanxi networks have more important effects in traditional markets than in modern markets.*

*H1d: Guanxi networks are more important in relationships with downstream partners than in relationships with upstream partners for vegetable sellers and buyers.*

### 4.3.3 *Guanxi* networks and contractual governance

The present study recognises the governance mechanism as part of a buyer-seller relationship. We emphasise the transaction conditions (e.g. quality, quantity, price, deliver conditions, etc.) which are specified and agreed upon between buyers and sellers. The more transaction conditions are specified and agreed upon, the more formal the transactions are (contractual governance).

The nature of the relationship between formal and informal agreements has been widely disputed in the literature (Poppo and Zenger, 2002; Schramm and Taube, 2003; Lazzarini *et al.*, 2004; Ferguson *et al.*, 2005). Two different views are identified. Some argue that formal contracts complement informal agreements in facilitating their self-enforcement, while others argue that formal contracts merely substitute for social norms that effectively support informal dealing (Lazzarini *et al.*, 2004).

The complementarity view suggests that the joint use of formal and informal arrangements provides more efficient outcomes than the use of either arrangement in isolation. North (1990) posits, '*formal rule can complement and increase the effectiveness of informal constraints.*' The major and most elaborate argument supporting the complementary view is based on the idea that (incomplete) formal contracts can facilitate the self-enforcement of informal agreements. They assert that formal contracts can reduce the gains from short-term defection, thereby increasing the value of honouring informal dealings (Poppo and Zenger, 2002). The clearly defined contractual terms and relational norms of flexibility, solidarity, and continuance may inspire confidence to cooperate in interorganisational exchanges (Poppo and Zenger, 2002). The specification of contractual safeguards promotes expectations that the other party will behave cooperatively and thus complements the limits of informal relational governance.

The substitution view considers that formal rules take over the operation of social norms supporting informal dealings. Sithkin and Roth (1993) assert that '*legalistic remedies can erode the interpersonal foundations of a relationship they are intended to bolster because they replace reliance on an individual's 'good will' with objective, formal requirements.*' Formal contracts damage the reciprocity norm embodied in informal agreements. According to the substitution view, the use of incentives of punishments can signal that no reciprocity is expected, thereby framing the relationship in a strictly economic, rather than social, orientation (Fehr and Gachter, 2002). As a consequence, incentives of punishments may damage the quality of exchange outcomes by discouraging an individual's voluntary willingness to cooperate, manifested through reciprocity norms (Lazzarini *et al.*, 2004).

*Guanxi* in China is recognised as an important part of the institutional environment (Guthrie, 1998; Schramm and Taube, 2003). The Chinese society and business life is confronted with new laws and regulations on the one hand, as well as its deeply rooted cultural 'law' of *guanxi* on the other. *Guanxi*, in some situations, can take precedence over legitimate decisions based on

law or regulations (Braendle *et al.*, 2005). Guthrie (1998) studied *guanxi* as an institutionally defined system (i.e., a system that depends on the institutional structure of society rather than on culture). He concluded that *guanxi* occupies a diminishing role in China. Thus the legal system (formal governance) will take over the influence of *guanxi* in the economic transition. Schramm and Taube (2003), however, observed recently that *guanxi* networks still prevail and co-exist with the legal system in China. They called for the study of the complementary effects of *guanxi* networks on formal governance. In this study, we follow the complementarity rather than the substitution view. The following proposition will be tested:

*H1e: There is a positive relationship between the support from guanxi networks and contract-based transactions for both sellers and buyers in buyer-seller relationships.*

We expect that there are differences regarding the impact of *guanxi* networks on contractual governance across channels. In the emerging domestic markets and international markets, contracts may dominate the transactions. In traditional market outlets, on the other hand, contracts are less used. Transactions are relied more on personal relationships. In other words, they are more relational based. We also expect a different impact of *guanxi* networks on contractual governance across buyer-seller relationships. Farmers (individual producers) are profit oriented. To maximise their profits, they may show opportunistic behaviour and switch frequently in finding high price buyers or high price markets. Formal contracts are less applied in farmer (individual)-based transactions because of high monitoring and enforcement costs. Therefore, *guanxi* networks have limited impact on contractual governance for vegetable farmers. Contracts, however, are widely used in company-based business transactions. Thus *guanxi* networks may have a significant and strong impact for vegetable companies. Therefore, the following proposition will be tested:

*H1f: The complementary effects of guanxi networks on contractual governance are stronger in modern market outlets than in traditional market outlets, and are stronger in company-based transactions than in farmer-based transactions.*

#### **4.4 Impact of buyer-seller relationships on market performance**

This section discusses the impact of buyer-seller relationships on market performance, representing the right side of the research model in Figure 4.2. As discussed in Chapter 1, we measure market performance in two stages: compliance with quality and delivery requirements and perceived performance indicators regarding efficiency, quality/price satisfaction and profitability. We therefore first discuss the impacts of buyer-seller relationships on compliance with quality and delivery requirements. Thereafter, the effects of compliance with quality and delivery requirements on market performance are discussed.

#### **4.4.1 Transaction specific investments and compliance with quality and delivery requirements**

As discussed in Chapter 2, multiple market outlets are available for vegetable sellers and buyers in China. The quality requirements and delivery conditions tend to differ widely amongst different outlets, producing various types of transaction costs and offering different incentives for the sellers and buyers to improve their production systems and marketing regimes (Ruben *et al.*, 2007b). The sellers can be successful only when they are able to deliver the right products at the right time to the right markets. The buyers, on the other hand, should also be able to buy the right products from the right market in order to achieve a good market performance. To satisfy the specific requirements regarding quality standards and delivery conditions of specific vegetable buyers, vegetable sellers have to upgrade their production system and improve their production practices. Thus specific assets are inevitably engaged. Transaction specific investments are important for vegetable sellers to improve production processes, to implement high quality standards and to comply with buyers' requirements regarding quality standards and delivery conditions. In other words, TSI make it possible for vegetable sellers to comply with buyer's request and deliver high quality products. Due to the differentiation of quality requirements and delivery conditions in different markets, transaction specific investments will also differ across market outlets.

TSI also foster preferred buyer-seller relationships. The sellers that are able to deliver a large part of the buyer's requirements are crucial to the buyers' success. TSI improve the capability to implement buyers' requirements. Compliance with delivery conditions and quality requirements then becomes a critical consideration for the selection of preferred suppliers. Preferred suppliers are most required in high-value market outlets with high quality requirements (e.g. processors, supermarkets and international markets). Based on the previous discussion, the following propositions are defined:

*H2a: There is a positive relationship between transaction specific investments in buyer-seller relationships (both sides) and the seller's compliance with channel quality requirements.*

*H2b: There is a positive relationship between transaction specific investments in buyer-seller relationships (both sides) and the seller's compliance with channel delivery requirements.*

Regarding the differences in buyer-seller relationships and in market outlets, we define the following proposition:

*H2c: The relationship between TSI and compliance with channel requirements are stronger in relationships with downstream partners than in relationships with upstream partners, and are stronger in modern market outlets than in traditional market outlets.*

#### **4.4.2 Transaction specific investments and contractual governance**

Transaction cost economics (TCE) is rooted in organisational economics and employs a doctrine of economic efficiency to explain the choice of governance structure (Robins, 1987). In Williamson's pioneering work (1979), the characteristics of transactions (e.g. asset specificity) were linked to the governance structure from 'classical contracting' (spot markets) at one end of the spectrum, to unified governance (vertical integration) at the other. The level of transaction costs incurred in the transactions encourages agents to build up closer business relationships.

Contracts are considered as a hybrid form of coordination (Peterson *et al.*, 2001). Contracts are the preferred means of coordination under conditions of high risks and uncertainty. Vertical and contractual arrangements provide the possibility to reduce the effects of uncertainty and opportunism. Transaction specific investments (TSI) pose a contractual hazard for any investor, either the sellers or buyers. The exchange partner can exploit such assets because they are not re-deployable, or at least they have a reduced value in an alternative exchange relationship. Williamson (1985) argued that in transactions with more one-sided, specific investments, the partners need more formal management due to the increased dependency of the investing partner on the other actor's cooperative behaviour. The formal governance consists of the agreements of the transaction conditions, such as the price, volume, quality, payments, and punishment in case of the violation. When the transactions involve a high level of transaction specific investments, detailed transaction conditions should be negotiated and agreed upon to reduce risk and uncertainty for the exchange partners. Therefore, a (complex) formal contract is applied. Thus we expect a positive relationship between TSI and contract based transactions. Therefore, we define the following proposition:

*H2d: There is a positive relationship between transaction specific investments in buyer-seller relationships (both sides) and contract-based transactions.*

Regarding the differences in market outlets, we define the following proposition:

*H2e: The relationship between TSI and contractual governance are stronger in modern market outlets than in traditional market outlets.*

#### **4.4.3 Interpersonal trust and compliance with quality and delivery requirements**

Interpersonal trust provides not only the benefits of calculative economics but also the affection and belief in partners and the security of a continuing relationship (Claro, 2004). Previous studies on trust demonstrated that trust contributes to joint action and flexibility (Morgan and Hunt, 1994; Zaheer and Venkatraman, 1995; Claro, 2004). Trusting buyer-seller

relationships have a great store of knowledge, experience and creativity to identify and solve problems based on mutual benefits. Thus if the sellers trust their buyers, they will be more willing to comply with the demand of their buyers (e.g. quality and delivery requirements) and react flexibly to the changing conditions (e.g. volume and variety).

According to Powell (1990) and Hakansson and Snehota (1995), interpersonal trust leads to a more rapid flow of information and a high level of open communication. A higher degree of interpersonal trust between buyers and sellers is beneficial to coordinative behaviour, whereas low trust leads to competitive behaviour. Long-term relationships and interpersonal trust encourage effective communication, information sharing and joint pay-offs (Dwyer *et al.*, 1987; Ring and Van de Ven, 1992) and may create a strong social bond (Barney and Hansen, 1994).

Interpersonal trust also creates a perceived supportive climate that encourages a firm to adapt as circumstances unfold (Anderson and Narus, 1990). Sitkin and Roth (1993) showed that relationships characterised by trust are highly valued by partners, and trusting partners have a strong desire to continue the relationship (Ganesan, 1994). However, the duration of buyer-seller relationships is strongly related to the fulfilment of buyers' requirements regarding quality and delivery requirements in business transactions. If the sellers fail to comply with the buyers' requirements, it will greatly harm the trust in the sellers by the buyers and thereafter influence future transaction opportunities. Thus trust increases the willingness for both counterparts to comply with transaction requirements regarding quality and delivery conditions. Thus we formulate the following propositions:

*H3a: There is a positive relationship between interpersonal trust in buyer-seller relationships (both sides) and the seller's compliance with channel quality requirements.*

*H3b: There is a positive relationship between interpersonal trust in buyer-seller relationships (both sides) and the seller's compliance with channel delivery requirements.*

Regarding the differences in buyer-seller relationships and in market outlets, we define the following proposition:

*H3c: The relationship between interpersonal trust and compliance with channel requirements are stronger in relationships with downstream partners than in relationships with upstream partners, and are stronger in modern market outlets than in traditional market outlets.*

#### **4.4.4 Interpersonal trust and contractual governance**

Trust in buyer-seller relationships significantly reduces the perception of risk associated with opportunistic behaviour by a partner. Trust increases the confidence that short-term

inequities will be resolved over time and reduces transaction costs in exchange relationships (Ganesan 1994). Thus trust counterbalances the need for a costly safeguard mechanism against opportunism because of the expectancy held by a supplier that the buyer's word or written statement can be relied on (Rotter, 1980).

In considering the role of trust in business transactions, we highlight the personal structure, processes and routines that create a context within which interpersonal trust can develop and persist (Rotter, 1980). This consideration is consistent with the characteristics of Confucian society where *guanxi* is a dominant social phenomenon. Under a high level of interpersonal trust, firms are less inclined to rely on elaborated safeguards for specifying, monitoring, and enforcing agreements (Ganesan, 1994). When there is a high level of interpersonal trust in buyer-seller relationships, it is most likely that the sellers and buyers will obey the agreements regarding transaction conditions. Thus the following proposition is defined:

*H3d: There is a negative relationship between the interpersonal trust in buyer-seller relationships (both sides) and contractual governance.*

Regarding the differences in different market outlets, we define the following proposition:

*H3e: The relationship between interpersonal trust and relational governance is stronger in modern market outlets than in traditional market outlets.*

#### 4.4.5 Interpersonal trust and transaction specific investments

A principal focus of transaction cost economics is the decision to create specific transactional assets. Bounded rationality and opportunism are two key assumptions of TCE (Williamson, 1985). Bounded rationality implies that human actors as well as firms are incapable of perfect contracting. As such, certain environmental and behavioural uncertainties inevitably arise. Opportunism is the assumption that, given the occasion, decision-makers may act with their own interests in mind (Williamson, 1985) and that it is difficult to know in advance who is trustworthy and who is not (Barney, 1990). Opportunism may lead to governance problems in situations of asset specificity. In case of highly asymmetric information and unequal negotiation power, vegetable farmers, as the weak group in the chain, do not have sufficient incentive to engage in transaction specific investments.

However, TSI are important for achieving closeness in a buyer-seller relationship. TSI reassures the counterparts about the intention and integrity of the investor. Creating specific assets is known as creating credible commitments (Heide and John, 1988) or pledges (Anderson and Weitz, 1989). Thus the existence of TSI largely restricts the channel access by new actors. TSI may be determined by the level of interpersonal trust one dedicates to the counterparts. Once

interpersonal trust is established, opportunistic behaviour and uncertainty (risk) will be much lower in transactions. Thus actors are more willing to invest in transaction specific investments to adhere to the requirements of their partners. Thus we define the following proposition:

*H4: There is a positive relationship between the level of interpersonal trust in buyer-seller relationships and the level of transaction specific investments conducted by the sellers and the buyers.*

#### **4.4.6 Contractual governance and compliance with quality and delivery requirements**

Formal contracts represent promises or obligations to perform particular actions in the future (MacNeil, 1981). The more complex the contract is, the greater the specification of promises, obligations and processes for dispute resolution (Poppo and Zenger, 2002). For example, complex contracts may detail rules and responsibilities to be performed, specify the quality of the products, negotiate the delivery place and time, decide the procedures for monitoring and penalties for noncompliance, and most importantly, agree on the outcomes. According to the logic of transaction cost economics, the manager's task is to craft governance arrangements with minimal cost that ensure the delivery of the desired products. A contract between a seller and a buyer implies a specific transaction, in which agreements, promises and the terms of the exchange are defined by price, asset specificity, and specified quantity, quality and duration (Williamson, 1996a). Long-term contracts are also explicitly drafted with provision to promote the longevity of exchange (Poppo and Zenger, 2002). If the sellers are not able to deliver the desired products to the buyers based on the contracts, the buyer-seller relationships will be terminated. The sellers may also lose transaction opportunities with other existing partners. Thus with a contractual arrangement, the sellers have more incentives and are more willing to comply with the buyer' requirements in terms of quality and delivery conditions. Thus we define the following propositions:

*H5a: There is a positive relationship between contractual governance in buyer-seller relationships and seller's compliance with channel quality requirements.*

*H5b: There is a positive relationship between contractual governance in buyer-seller relationships and seller's compliance with channel delivery requirements.*

#### **4.4.7 Compliance with channel requirements and market performance**

The sellers and buyers that comply with channel requirements are likely to perform better. As discussed earlier, complying with channel requirements in terms of quality and delivery conditions are prerequisites for building and maintaining long-term and close buyer-seller relationships.

Traditional marketing channels function in a rather inefficient manner and face strong competitions due to its low cost to get access. The quality standards and delivery requirements are generally low. Price differences are also low for vegetables with different quality standards due to the problems in discriminating quality. The emerging markets and international markets, however, recognise the differences in quality standards and therefore pay differently for low and high quality vegetables. Quality and delivery requirements in modern market channels are much higher than that in traditional markets. Farmers can be more successful in markets if they are able to deliver the required quality products. Farmers can achieve a good market performance regarding profitability and efficiency if they are able to comply with buyers' delivery requirements in terms of time, place and volume. Therefore we define the following propositions:

*H6a: There is a positive relationship between the seller's compliance with channel quality requirements and good market performance for (both) the sellers and the buyers.*

*H6b: There is a positive relationship between the seller's compliance with channel delivery requirements and good market performance for (both) the sellers and the buyers.*

## 4.5 Concluding remarks

This chapter expands upon the understanding of the theoretical discussion of the relations among the concepts presented in Chapter 3. Several propositions are defined regarding the interrelations among the concepts of *guanxi* networks, buyer-seller relationships and market performance.

It is important to mention that the development of a relationship contains loops and is not always a sequential process. The propositions defined in this chapter are sequential and based on the theoretical thoughts presented in Chapter 3. However, we must realise that some concepts mutually affect each other. For instance, good performance may have a positive effect on interpersonal trust. *Guanxi* networks may also be improved when both the sellers and buyers make profit and consequently, buyer-seller relationships may be stronger. Moreover, some direct and indirect relations between the concepts might occur in practice. Empirical evidence discovered that *guanxi* networks have a positive connection to firm performance (Luo and Chen, 1997; Ambler *et al.*, 1999). *Guanxi* networks also show a direct effect on farmers' quality compliance (Lu *et al.*, 2006). We examine such effects in qualitative case study in Chapter 6 and quantitative survey analysis in Chapter 7.



# Chapter 5 Research design

This chapter provides insights into the methods used for the present study, both the case study and the questionnaire survey. The case study is used to refine our thoughts about the relationship between *guanxi* networks, buyer-seller relationships and market performance. These thoughts allow us to define the precise questions for the survey. We also use the information obtained from the interviews to interpret the quantitative survey results. The combination of qualitative and quantitative approaches provides a comprehensive understanding of the effects of *guanxi* networks on buyer-seller relationships and on market performance in Chinese vegetable supply chains. Section 5.1 starts with the general introduction of the study population. Afterwards, the design of case study and questionnaire survey are presented in Section 5.2 and Section 5.3 respectively. Section 5.4 discusses the measurement of formative and reflective constructs. The data analysis approach partial least squares (PLS) is presented in Section 5.5. We introduce multinomial and binary logit model for marketing channel choice analysis in Section 5.6. This chapter ends with the motivation of using PLS for model estimation.

## 5.1 Study population

To gather empirical data on the indicator of *guanxi* networks in the chains, three steps are followed. First, based on a classification from Jiangsu Provincial government, we identified the participants involved in vegetable production, processing, exporting, and retailing. To select sufficient vegetable producers in Jiangsu Province is easy as there are many farmers engaged in vegetable production. The second step was to design a questionnaire that covers the factors to discover the contribution of *guanxi* networks on buyer-seller relationships and on chain performance. Information from about ten experts, officials and businessmen was collected during interviews in an effort to identify the convergence of themes and patterns (Miles and Huberman, 1994; Yin, 2003). The specific knowledge from the experts was brought together in general start-up concepts (Eisenhardt, 1989). These general concepts, together with previous literature, were brought into an initial questionnaire. During a pre-test period, eight companies that are active in different stages of the supply chains (production companies, processing and exporting companies, cooperatives, and supermarkets) were tested for the initial questionnaire. The pre-test resulted in a structured questionnaire that met this study's goal of simplicity and completeness. The structured questionnaire was used for data collection. The final step was to collect data from vegetable producers and other chain participants. The triangular approach of using case interviews, pre-test and structured questionnaires allows for the establishment of factors that helps to explain the role of *guanxi* networks in the chains (Yin, 2003).

The study population of the vegetable producers is rather large. More than a million farmers are engaged in vegetable production in Jiangsu Province. Some farmers are specialised in vegetable production as they devote all their farmland to it. Those farmers mostly live in suburban areas

close to local and city centre markets. They not only have a long-term vegetable production experience, but also a rich experience in vegetable marketing. Other farmers, however, produce vegetables only for their own consumption. They sell vegetables to markets only if they have surplus. These farmers lack of marketing experience. The objective of this study is to examine buyer-seller relationships in chains, so we are looking for vegetable farmers with connections to vegetable markets and have intensive relationships with the buyers. Thus we target the first group of vegetable producers as the source of our farmer sample.

There are different types of participants in vegetable chains, such as traders, processors, exporters, and retailers. To depict the structure of the vegetable supply chains, we are required to collect information from all participants in the vegetable supply chains, processing companies, exporting companies and retailers (such as supermarkets) in Jiangsu Province. Based on information from different sources, the total number of processing and exporting companies is around 300. Due to the lack of statistical data, we are not able to predict the total trader population in Jiangsu Province.

## **5.2 The case study**

Case study research is especially useful to investigate real life situations and provide rich insights into a research objective (Miles and Huberman, 1994). A case study is a desirable research strategy for the exploratory phase of an investigation, because '*it investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident*' (Yin, 2003). As a synergistic complement to a quantitative (i.e. survey) research strategy, the case study can be used to explore and fully describe the meaning of a certain phenomenon in its environment instead of through the evaluation of statistics (Eisenhardt, 1989).

### **5.2.1 Case study design**

The cases aimed primarily to refine our thoughts about the relation between *guanxi* networks and buyer-seller relationships and market performance. The case study was designed using the methods provided by Yin (2003). The first task of a case study is to define the research question. Compared to quantitative methods, case study is more likely to be appropriate for how and why questions. We use the case study design to answer the following research question:

*'How do guanxi networks influence buyer-seller relationships (i.e., interpersonal trust, transaction specific investments and contractual governance) and ultimately, market performance in vegetable supply chains in China?'*

The second use of the case study design is to fine tune the research framework, formulate the questions for data collection more precisely and specify variables needing special attention.

The major objective of this study is to investigate the effects of *guanxi* networks on buyer-seller relationships and on market performance. The main units of analysis are thus the chain actors' relationships in the vegetable markets in China, such as processing companies, exporting companies and supermarkets.

Yin (2003) proved that the linkage of data to propositions and the criteria for interpreting the findings should be carried out in a case study design. The disadvantages of the case study, such as the small number of observations, can be alleviated by a precise case study design. Eisenhardt demonstrated this by using single and/or multiple case designs (Eisenhardt, 1989, 1991).

In order to assure the validity of the operationalisation, a case study protocol<sup>18</sup> is used to collect data. Due to the major differences of business characteristics, we designed a specific protocol for each type of case (vegetable production company, processing company, exporting company, and supermarket). We summarise the constructs used in the case study in Table 5.1.

### 5.2.2 Data collection

Four types of in-depth case interviews (production companies, processing and exporting companies, cooperatives, and supermarkets) were conducted. Data were collected through a total of eight in-depth, face-to-face interviews with key informants. Companies with different market positions in vegetable supply chains were selected. The companies are involved in vegetable production, processing, exporting, and retailing in vegetable supply chains in Jiangsu Province, P.R. China. A detailed description of the companies that participated in the case study is provided in Chapter 6. The companies have to be willing to invest time in in-depth interview(s), allowing the researcher to visit the facilities for observation and to examine written documents.

The semi-structured interviews were conducted between January 2004 and October 2005. Informants are company owners or the sector manager in the company. The procedure to start a case interview follows several steps. First, we selected the company in our targeted population. Several companies active in different functions in the supply chains were selected or introduced by provincial officials. Second, we made a phone call to indicate our purposes and make an appointment about the interview date. The case protocol was then sent to the interviewees for preparation. Finally, the interview was conducted in the office of the interviewees.

The case protocol was used to investigate the elements of the theoretical framework. Each interview was digitally recorded and lasted, on average, one hour. A tour in the company followed the interview with the key informant. The transcripts of the digitally recorded

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<sup>18</sup> The case protocol is presented in Appendix A.

*Table 5.1. Variables, operationalisation and basics of the case study protocol.*

<b>Variables</b>	<b>Operationalisation</b>	<b>Reference</b>	<b>Measures*</b>
Guanxi networks	Personal connections in business and social life.	Adapted from Wong and Leung (2001), Standifird and Marshall (2000)	A14-20
Interpersonal trust	The belief that the other partner is honest and sincere, and in no circumstances will deliberately do anything that will damage the relationships and incur cost for them.	Zaheer <i>et al.</i> (1998), Ganesan (1994), Anderson and Narus (1990), Claro (2004)	A9, A19
Transaction specific Investments	Investment made specifically for the transaction with the selected counterpart with a large loss of value in case of redeployment.	Bensaou and Venkatraman (1995), Heide and John (1992), Klein <i>et al.</i> (1990), Williamson (1985), Claro (2004)	A20
Channel requirements and governance arrangements	Channel requirements and governance arrangements in buyer-seller relationships, e.g. compliance with quality and delivery requirements, contractual governance.	Poppo and Zenger (2002), Ferguson <i>et al.</i> (2005), Williamson (1985)	A7-10, A13
Performance	Achievement of the goals: profitability, efficiency and quality/price satisfaction.	Mohr and Speckman (1994) and Anderson and Narus (1990)	A10-11, A21-22

Note: A14 refers to the 14th question in Appendix A.

interviews were analysed for each company. Some informants were contacted later by phone and/or e-mail to elucidate unclear points.

### **5.3 The survey**

A survey methodology is employed to set up the quantitative part of our empirical research and to collect data to test the propositions developed in Chapter 4. Since this research requires data on respondents' perceptions of buyer-seller relationships, the precise data requirements of this study have to be carefully considered. Respondents, as decision makers, make their decisions not only based on objective data, but also on their subjective judgment (Churchill, 1999). Both subjective and perceptual data are therefore relevant, because behavioural concepts, such

as trust and satisfaction are used. These concepts are dependent on how respondents perceive certain behaviour as being, for example, trustworthy or not. Previous research has shown the questionnaire to be a viable research instrument for gathering such perceptual and subjective data (Claro, 2004).

### 5.3.1 Questionnaire design

A multiple-item questionnaire<sup>19</sup> was designed based on the literature and improved using the results of the case studies. Most of the constructs are measured by multiple-item scales. Several techniques can be used to generate questionnaire items, for instance, literature search and interviews involving relevant actors (Churchill, 1999). In our research, we explored both techniques.

Question construction and wording began with a review of the literature with a special focus on generating a pool of items that tap the core elements (*guanxi* network, buyer-seller relationships and performance) in our conceptual framework (see Figure 1.1). Additionally, the eight in-depth field interviews carried out as case studies provided a great deal of information about the concepts used in this study. Two Chinese researchers who specialise in business relationships assessed the content validity of the items. For all the measurement scales we tried to draw on published, validated scales and items. After alterations of editing and refinement, we performed a content analysis to determine the overlap of the remaining items with the conceptual domain of the measurement scale. To enhance translation equivalence, the original English version of the questionnaire was first translated into Chinese by a Chinese researcher and then retranslated back into English by another, each of whom was fluent in both languages. Any differences that emerged were reconciled by the two researchers. The questionnaire for vegetable farmers was designed based on the earlier questionnaire which was developed by the author in 2002 in the same research area for a master study. The earlier questionnaire was tested in 2002. Thus we did not perform a pre-test for the producer questionnaire this time.

The questionnaires were first filled out by the eight case companies as pre-test interviews. These interviewees were asked to complete the questionnaires and raise questions where problems and ambiguities arose with wording and questionnaire layout. This yielded useful suggestions that improved the content validity of the measurement instruments. The questionnaires for processing companies and exporting companies were first designed, after which the questionnaires for supermarkets and farmers were created. Due to the specific characteristics of different companies, few adjustments were necessary in the questionnaires for supermarkets and farmers. The same procedure to test content validity and translation equivalence was strictly followed for later questionnaires. Finalised questionnaires were used to conduct the survey for vegetable farmers and buyers in the research area.

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<sup>19</sup> The questionnaires used in the field survey are presented in Appendix B and C.

### 5.3.2 Data collection

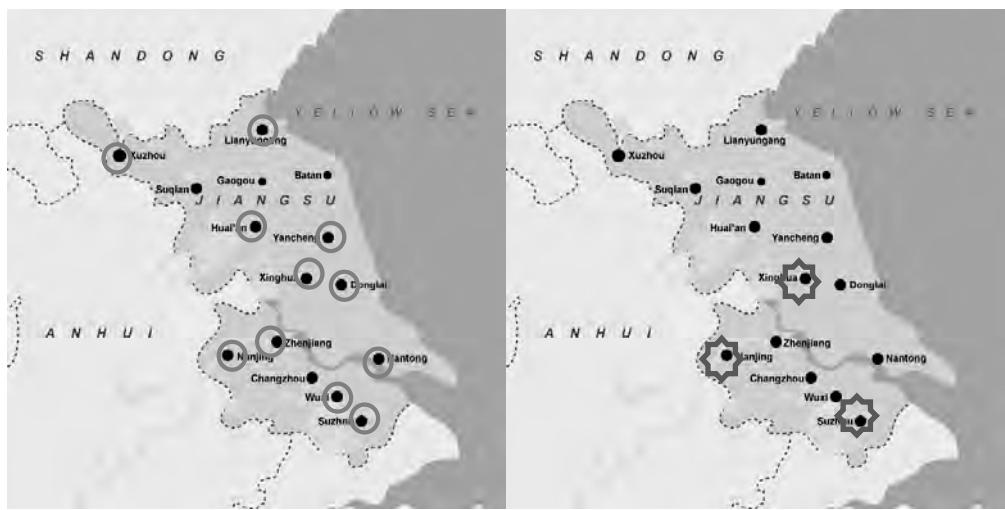
Data collection was conducted based on personal interviews. We chose personal interviews for several reasons. First of all, we were going to collect data with information describing *guanxi* networks and buyer-seller relationships. Five to ten pages of questions (see Appendix B and Appendix C) need about one to two hours to complete, so telephone is not an efficient way for collecting data. Internet also showed limitations due to the fact that farmers lack of access to computers and thus to the internet. Second farmers are not experienced with academic research. Farmers are not used to filling in questionnaires or answering questions over the telephone. Therefore all these data collecting methods show certain limitations if used in China. Third, mailing methods often lead to low response rates which may result in serious sample size problems in case the original population is small (this is the case for processing and exporting companies in Jiangsu Province). Fourth, vegetable farmers are less educated. They may have problems understanding the questionnaires precisely. Lastly, personal interviews give us the possibility to collect data in a friendly way and to guide the respondents in case further explanations are needed. Personal interviews end with a small gift to thank participants for their efforts and cooperation which will further enhance the possibility for revisiting later (to validate the results). However, personal interviews also show some shortcomings. The quality of the data will be influenced by the interviewers' attitude and the understanding of the questions. To avoid this problem, we carefully trained our fieldwork assistants to good knowledge of the research purpose and to fully understand the questions in the questionnaire.

The data collection procedures were greatly helped by the researcher's previous working experience and personal *guanxi* network. The first task for data collection is to search for the companies we want to interview. Due to the lack of integrated statistical data, we could not find an overall picture of the vegetable industry in China.

The sampling procedure for vegetable producers was rather simple following a stratified random sampling scheme. Base on the economy level, we classified Jiangsu Province into three different areas: developed, average and less developed areas. Within each area, we selected farmers who have different conditions to access to markets. In total we interviewed 167 farmers across Jiangsu Province. A brief location of farmer sample is showed in Figure 5.1a. All interviews were conducted in the field. Trained student assistants were hired to support carrying out the interviews.

The sampling procedure for the buyer sample was much more complex. Different sources were used to track the sample. The first and most important source was the agricultural departments at different level of Jiangsu Province. We got a name list of the so-called Dragon-head enterprises<sup>20</sup>

<sup>20</sup> Dragon-head enterprises are large-scale companies which have close contact (such as contracts) with small-scale producers. In some cases, Dragon-head enterprises vertically integrate production (own production base), processing, marketing, and services. Dragon-head enterprises mostly deal with agri-food products. In this study, we only focus on those companies who are mainly active in the vegetable markets.



a) Vegetable farmer sample locations

b) Vegetable buyer sample locations

Figure 5.1. The location of the farmer and buyer samples.

involved in vegetable processing and marketing in Jiangsu Province. The second important source was the internet. Using search engines (such as Google, Yahoo, and Baidu), we searched for company and sale/purchasing information. Third, a very important information source was my personal *guanxi* network. My friends and former colleagues introduced me to the companies in which I was interested. In total about 300 companies were identified in Jiangsu Province including processing companies, exporting companies, and retailers (such as supermarkets).

To acquire an interview with a manager in a Chinese company is not an easy task. First, I made a phone call and explain the reason for an interview. In some cases, the contact persons in my *guanxi* network helped me to contact the companies. Although it took me much effort to communicate, this is the most efficient way to do research in a *guanxi* rooted society. Second, once the company accepted to have an interview, the interview plan (the tentative time and place) and the questionnaire was sent to the contact person in the company for preparation. Third, the interviews were conducted based on the survey questionnaires. The interview and the discussion about related topics for background information were recorded with permission of the interviewee. In total 84 vegetable processing and exporting companies and supermarkets located in three major cities were interviewed (Figure 5.1b). It should be mentioned that Xinghua County is an important vegetable processing and exporting area in Jiangsu Province. The vegetable processing industry has a long history in Xinghua County and has developed rapidly in recent years. In total about 100 processing and exporting companies are clustered in this area, among them, twelve were interviewed.

As noted by Anderson and Narus (1990), collecting buyer-supplier relationship data is difficult and requires considerable cooperation from the companies involved. To minimise response bias, we sought to identify the knowledgeable informant within each company. The informants in this research were the general managers or the sector managers of the company who own full knowledge about the purchasing and marketing activities. When responding to questions about buyer-seller relationships, channel choice and governance attributes, informants were asked to consider the most important buyers/suppliers and channels. For those farmers or companies who have multiple channels, they were requested to indicate two most important channels. One important buyer-seller relationship in each channel was identified for further information. The data were collected between January 2004 and October 2005 in the selected areas in Jiangsu Province.

### **5.3.3 Sample size**

A natural concern for full-information estimation methods which depend on large-sample properties is the sample size needed to obtain meaningful parameter estimates. Although the guidelines on minimum samples sizes have not been determined in literature. However, the common estimation procedures have been found to provide valid results with sample size as small as 50, but such a small sample is not recommended (Hair *et al.*, 1998). It is generally accepted that the minimum sample size to ensure appropriate use of maximum likelihood estimation is 100 to 150 (Ding *et al.*, 1995). In a Monte Carlo study, Anderson and Gerbing (1984) and Gerbing and Anderson (1985) investigated Maximum Likelihood estimation (MLE) for a number of sample sizes and a variety of confirmatory factor models in which the normal theory assumption was fully met. They concluded that a sample size of 150 or more was typically needed to obtain parameter estimates that have standard errors small enough to be of practical use. Earlier studies of Tanaka (1984) and Harlow (1985) suggested that a sample size of at least 400 or 500 was needed. However, if sample sizes become so large, the MLE method becomes 'too sensitive' and almost any difference is detected, making all goodness-of-fit measures indicate poor fit (Tanaka, 1987; Marsh and Hocevar, 1988). Although there is no correct sample size, recommendations are for a size ranging between 100 to 200 (Hair *et al.*, 1998). In total 167 vegetables producers and 84 buyers were finally reached to fill out the questionnaires which, at least for the buyer side, are not enough to conduct covariance-based structural equation modelling. Therefore we applied a smaller sample size requiring approach for data analysis, which will be discussed in Section 5.5.

### **5.3.4 Constructs used in the research**

The operationalisation of the concepts is an important element in survey research. Except the construct of profitability, multiple items were used to derive a measure for constructs in this research. Most constructs in this research used closed-response questions and were measured at ordinal levels with five-point Likert-scales. Although the ordinal scales present the problem of the intervals between the data points not being equal, De Vellis (1991) suggested to treat

these ordinal scales as interval measures and assume equality of the intervals between the data points. Thus the best procedure seems to be to treat ordinal measurements as interval measures while remaining alert for possible inequalities of intervals (De Vellis, 1991). Computation of the scores derived from multiple-item scales can be done either by an unweighted average (Hair *et al.*, 1998) or weighted average (Chin, 1998). Appendix B and C present the items used in the questionnaire survey. Next, we will discuss each construct used in this study. We summarise all the constructs in Table 5.2.

#### 5.3.4.1 Guanxi networks

Networks are the sets of connected relationships that are contingent upon each and that influence a focal relationship (Cook and Emerson, 1978). As discussed in Chapter 3, the contingency is related to the benefits that are provided by the connected relationships and that support the focal buyer-seller relationships. *Guanxi* networks in the Chinese context refer to different types of personal relationships linked together to become a relationship web which benefits people involved in the web. We did not distinguish the 'source' (family *guanxi*, friend *guanxi* or business *guanxi*) of the benefits. We particularly focus on the 'content' of the *guanxi* network, that is, what kinds of benefit can be obtained from *guanxi* networks. Thus *guanxi* networks in operationalisation refer to the utilisation of *guanxi* networks to help the farmers and buyers in vegetable production and marketing activities. The general questions are asked such as 'To what extent your *guanxi* networks support to find new buyers, to access (new) markets, to improve production techniques'.

#### 5.3.4.2 Interpersonal trust

Anderson and Narus (1990) view trust as the belief that the partner will perform actions that will result in positive outcomes for the firm. Moorman *et al.* (1993) define trust as the willingness to rely upon an exchange partner in whom one has confidence. Both definitions view trust as a behavioural intention that reflects some reliance upon the exchange partner. Nooteboom (2002) defined trust as trust in things or people that entails willingness to submit to the risk that they may fail us, with the expectation that they will not, or the neglect or lack of awareness of the possibility that they might. Broadly defined, trust reflects the extent to which negotiations are fair and commitments are sustained (Anderson and Narus, 1990) and the extent to which one party believes that its requirements will be fulfilled through future actions undertaken by the counterpart (Anderson and Weitz, 1989; Barney and Hansen, 1994). Trust, then, refers to the shared belief that in the long run, rewards will be distributed fairly among the partners (Barney and Hansen, 1994). Trust is an important lubricant of relationships. It binds parties and has an important future orientation (Ganesan, 1994).

To reflect the core concept of personal-based linkages of *guanxi* networks, this study draws on personal interaction with the aim of capturing the features of trust on personal level. Interpersonal trust reflects the extent to which a boundary-spanning agent trusts his or her specific counterpart

*Table 5.2. Operationalisation of the variables, measures.*

<b>Variables</b>	<b>Operational definitions and indicators</b>	<b>Measures*</b>
<b>Guanxi networks</b>		
Support from <i>guanxi</i> networks	The support provided by <i>guanxi</i> networks to the sellers and buyers in vegetable business activities.	B21-27, C18-23, C63-67
<b>Buyer-seller relationships</b>		
Transaction specific investments	Investments made specifically for the market channel with a large loss of value in case of redeployment.	B28-32, C24-27, C68-71
Interpersonal trust	The belief that the business counterparts are honest and sincere.	B33-40, C28-35, C72-79
Contractual governance	Transactions are conducted under certain pre-agreed transaction conditions.	B42-45, C39-40, C80-84
<b>Channel choice and compliance with channel requirements</b>		
Channel choice and compliance with channel requirements	Sellers and buyers participate in different marketing channels under different governances and the compliance with channel requirements	B7, B9-12, B41, C6, C10-13, C36, C53, C56-58, C80
<b>Performance</b>		
Compliance with quality requirements	Level of channel quality requirements	B46-48, C41-43, C88-90
Compliance with delivery requirements	Level of channel delivery requirements	B49-51, C44-65, C86-87
Quality/price satisfaction	Buyers are satisfied with the product regarding vegetable quality; Sellers/buyers are satisfied with the prices received from buyers/paid to sellers.	B52-54, C48-49, C91-92
Efficiency	The time involved and costs incurred in vegetable transactions for sellers and buyers.	B56-58, C51-52, C95-96
Profitability	To what extent sellers and buyers achieve expected profitability.	B59, C5

Note: \*: B28 refers to the 28th question in Appendix B; C24 refers to the 24th question in Appendix C.

(Zaheer *et al.*, 1998). In a buyer-seller relationship, interpersonal trust is placed by the sellers on buyers (or in the other direction, placed by the buyers on sellers). Interpersonal trust in operational terms refers to the personal belief that the other person is honest and sincere and in no circumstances will deliberately do anything to damage the relationships and incur cost for him. Previous transaction experience, reputation and trustworthiness are the major reflective perspectives for trust (Zaheer *et al.*, 1998; Claro, 2004).

#### 5.3.4.3 *Transaction specific investments*

Transaction specific investments (TSI) are other critical elements in buyer-supplier relationships (Claro, 2004). The ramifications of the decision to create specific transactional assets are the principal focus of transaction cost economics (Williamson, 1985). TSI are important in achieving closeness buyer-buyer relationships. TSI reassure the counterpart about the intentions and integrity of the investor. Creating specific assets is known as creating credible commitments (Heide and John, 1988) or pledges (Anderson and Weitz, 1989). Thus the existence of TSI largely restricts the marketing channel and governance access for the sellers and buyers.

TSI refer to the seller's (or buyer's) perception of the extent to which an investment was made specifically for the transactions with the selected counterpart. These investments can be physical or human investments. The physical TSI refer to investments such as equipment (or machinery), facilities, etc. specifically for the counterpart. The human TSI refer to investments in human resources, such as the training of staff in terms of knowledge about counterparts, methods to deal with counterparts, and other business practices to operate specifically with counterparts. We did not make a distinction between physical and human TSI in this study. Rather, we combined them as a general construct which was measured with several related questions such as 'We have made large investments for vegetable production in the last three years for this buyer/seller' and 'If we stop to do business with this buyer/seller, we would waste a lot of investment/knowledge that we have made for this buyer/seller'. This instrument is developed based on previous studies (Heide and John, 1988; Claro, 2004).

#### 5.3.4.4 *Channel choice and compliance with channel requirements*

Brassington and Prttitt (2003) define a marketing channel as the structure linking a group of individuals or organisations through which a product or service is made available to the consumer or industrial user. Marketing channel decisions are among the most critical decisions facing management (Kotlor, 1988). The degree of formality in the relationships between the channel members can vary significantly, from the highly organised arrangements in the distribution of fast-moving consumer goods through supermarkets, to the more speculative and transient position of a roadside seller of fruit and vegetables (Brassington and Prttitt, 2003).

Marketing channel theory gives the incentives both for upstream actors (i.e., farmers) and downstream actors (i.e., retailers) to engage in communication and mutual adjustment to minimise market uncertainty and opportunistic effect to respond to changing consumer demands. There are rich opportunities both for farmers and buyers to conduct transactions for fresh produces through different outlets under different governances in China (Lu, 2003). For a better understanding of the marketing behaviour for small-scale farmers, we investigate the factors (e.g. personal characteristics, resource endowment and social capital) that determining the farmers' marketing participation.

Delivery conditions and quality demands differ widely among different market outlets, occasioning various types of transaction costs and offering farmers different implicit incentives for improving their production systems or management regimes (Ruben *et al.*, 2007b). In order to be successful and gain profits from vegetable businesses, both sellers and buyers tend to focus on quality and delivery conditions. Sellers are required to deliver high quality vegetables to buyers at the right time to the right place. Buyers, on the other hand, would like to purchase high quality vegetables from the right place for the right price. Thus sellers tend to comply with buyer's requirements regarding vegetable quality and delivery conditions are able to succeed in building up long-term buyer-seller relationships. Thus we focus on compliance with quality requirements and delivery requirements in this research.

#### *5.3.4.5 Contractual and relational governance*

Based on transaction cost economics, contractual and relational transactions are made to minimise transaction costs (Williamson, 1979). Contracts are a preferred means of coordination under higher risks and uncertainties. Quality, quantity, price, rights and obligations are the major specified items in a contract. Relational transactions (bilateral and/or unified governance), on the other hand, are defined as the recurrent transactions that are completed based on long-term relationships between two parties with mixed or idiosyncratic investments. Although it may not always be explicitly specified, the sellers and buyers make agreements for important transaction elements, such as quality, quantity, price, etc. The agreements may reflect the mutual understanding based on long-term business relationships or oral commitments.

Both contractual and relational transactions exist in the vegetable sector in China. They share some common attributes. It means that the contents in a contract or oral commitment are similar and thus become our focus. Both sellers and buyers will energetically discuss for better solutions in terms of quality, quantity, price and delivery. All these can be determined in advance or during transactions. The more items (price, quality, quantity, etc.) that are agreed by the sellers and buyers before actual transactions, the less risk and uncertainty for ongoing transactions (also less opportunistic behaviour) are likely to happen. Thus current research defines contractual governance based on the agreements between the sellers and buyers regarding price, quality, quantity, and delivery conditions. Questions like 'Price is pre-agreed with my buyers' and 'Quality is pre-agreed with my buyers' are asked to define contractual governance.

#### *5.3.4.6 Performance*

Both financial and non-financial indicators are employed in literature on buyer-seller relationships to measure performance (see Table 5.3). As discussed in Chapter 3, buyer-seller relationships involve uncertainty and risk. This may imply that the different parties have different performance interests. In fact, performance indicators differ in many buyer-seller relationships (Rindfleisch and Heide, 1997).

Table 5.3. Performance measures of buyer-seller relationships.

Performance measures	Example of research
<b>Financial indicators</b>	
Growth of sales/purchase	Mohr and Speckman (1994); Walker (1994); Kalwani and Narayandas (1995); Uzzi (1996); Moorman and Miner (1997)
Overall profitability	Mohr and Speckman (1994); Walker (1994); Kalwani and Narayandas (1995); Jap (2001); Uzzi (1996); Moorman and Miner (1997); Kemp and Ghauri (2001)
Efficiency (e.g. delivery lead time, total cycle time)	Ruston and Oxley (1991); Christopher (1992); Steward (1995)
Multiple and composite scales (including the above mentioned and, e.g. productivity, market share)	Bensaou and Venkatraman (1995); Lusch and Brown (1996); Bello and Gilliland (1997); Zaheer et al. (1998); Johnson (1999); Tracey and Tan (2001).
<b>Non-financial indicators</b>	
Satisfaction with counterpart	Anderson and Narus (1990); Mohr and Speckman (1994); Bensaou and Venkatraman (1995); Bello and Gilliland (1997); Zaheer et al. (1998); Calantone et al. (1998); Geyskens et al. (1998)
Continuity of the relationship	Anderson and Weitz (1989); Lusch and Brown (1996); Johnson (1999); Ganesan (1994); Kalafatis (2000); Toni et al. (1994); Mason-Jones and Towill (1997)
Diverse set of non-financial performance measures (e.g. product turnover and percentage of on-time delivery)	Noordewier et al. (1990); Walker (1994); Kalwani and Narayandas (1995); Stewart (1995); Jap (2001); Kemp and Ghauri (2001); Verhoef et al. (2002)
Marketing effects	Kim (1999); Cannon et al. (2000); Verhoef et al. (2002)

Source: Adapted and modified from Claro (2004).

Previous studies use a variety of financial indicators (both subjective and objective), such as profitability and efficiency to measure performance. Financial indicators can be obtained from either primary or secondary sources. Financial data based on secondary sources may not be fully appropriate or interpretable in a reliable way. As a result, empirical studies are widely based on primary resources. For example, Mohr and Speckman (1994) and Kalwani and Narayandas (1995) used a single-item perceptual measure of overall profitability combined with a single, objective question about the sales growth rate. The advantage of this type of indicator is its ability to provide a reliable and comparable measure of the extent to which a firm has achieved its overall objectives. The objectives might be financial and could also be strategic. Anderson and Narus (1990) argued that the success or failure of a buyer-seller

relationship should also be evaluated based on the extent to which objectives are achieved. Some authors have focused on the increase in trade share accounted for by the counterpart (e.g. Moorman and Miner, 1997). Since the goals of the counterpart's trade share increase, the performance of the buyer-seller relationship grows.

Financial indicators have also been measured in multiple-item scales containing subjective indicators. These encompass the complexity and multidimensionality of the performance concept within the buyer-seller relationship. For instance, Lush and Brown (1996) and Bello and Gilliland (1997) developed a seven-item performance assessment scale containing items related to sales growth, profitability, labour productivity, market share, etc. Bensaou and Venkatraman (1995) also used a multi-item scale to assess both financial and non-financial performances. Literature on buyer-seller relationships contains references to diverse measures of non-finance performance like product turnover, percentage of on-time delivery and percentage of defective products. Furthermore, some authors have looked at continuity and length of the relationship as a measure of performance in long-term relationships; others have examined market aspects, such as product differentiation, market access and international penetration. In sum, scholars focusing on single or combined financial measures claim that performance should be measured by the extent to which goals have been achieved.

Additionally, studies have employed subjective measures of non-financial performance, such as satisfaction and continuity. Anderson and Narus (1990) stated that one party's satisfaction with another is determined, in part, by how well the buyer-seller relationship achieves performance expectations. According to Walker (1994), this broad-based approach has the advantage of encompassing a variety of non-financial performance dimensions. The satisfaction measure includes financial performance, since it is unlikely that a manager would feel satisfied about a buyer-seller relationship that does not maintain at least a minimal level of economic performance.

In sum, performance can be evaluated in a variety of ways. In a buyer-seller relationship, performance measurement and evaluation require special attention. This study therefore uses multiple measures, both financial (efficiency and profitability) and non-financial performance indicators (quality/price satisfaction).

*Efficiency:* Efficiency relates to costs and time involved in vegetable transactions. Transaction costs incurred in vegetable transactions dramatically reduce efficiency. Transaction costs are high for the vegetable sector in China due to a less developed infrastructure and market information system. The sellers and buyers spend much time and effort in searching for market information, finding transaction partners and delivering products to markets. In this study, we use time and costs to indicate transaction efficiency. The questions asked are: '*It takes me less time to deliver to/ purchase from this market.*' and '*It costs me less to sell to/purchase from this markets.*'

*Quality/price satisfaction:* This construct include questions related to quality satisfaction and price satisfaction. Vegetable quality, a diversified concept, becomes the most important attribute for agri-products. Good quality is a guarantee for a successful business and long-term benefits. Vegetable quality can be measured in two different aspects: subjective and objective. Subjective quality refers to the perception of sellers and buyers regarding the vegetable quality. Objective quality, on the other hand, refers to physical indices, such as size, shape, colour, nutrition, and applied quality standards. Due to the difficulties in measuring physical quality indicators, we apply a subjective quality measurement approach, which is perceived quality satisfaction. Quality satisfaction is influenced by actual product quality and the expectations. If the actual quality is higher than the expectation, satisfaction will increase; otherwise, satisfaction decreases.

Satisfaction regarding product quality significantly influences business transactions. If sellers cannot deliver high-quality vegetables, the business relationships cannot last too long and transactions will not occur. Sellers who can deliver high-quality vegetables are perceived as good suppliers. Thus they can get a good price. The general questions used to measure quality/price satisfaction are: '*My buyers are satisfied with my vegetable quality*'; '*My vegetable can pass quality inspection*'; and '*I am satisfied with the prices get from buyers*'. This instrument is developed based on previous studies (Bensaou and Venkatraman, 1995; Zaheer *et al.*, 1998; Claro, 2004) and insights gained from the case studies.

*Profitability:* Profitability is a most commonly used financial (objective) indicator for performance measurement (Lusch and Brown, 1996; Claro, 2004). Profitability refers to what extent firms can achieve their profits in vegetable transactions. Profitability is also used in this study to measure the overall profitability that allows comparisons to be made between companies of different sizes (Lusch and Brown, 1996). Profitability in this research indicates the vegetable operation performances of vegetable sellers and buyers. Based on case studies, we realised that it is very sensitive for interviewees to provide information about their profit based on their balance sheet. Either they are not willing to tell you, or they provide fake information. Thus we measure profitability in a subjective way by asking them to indicate to what extent they can achieve their expected profitability.

## 5.4 Constructs measurement

This section discusses the reliability and validity of reflective and formative constructs used in this study<sup>21</sup>.

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<sup>21</sup> For a detailed discussion on the definition and comparison of formative and reflective indicators, please refer to Fornell and Cha (1994), Diamantopoul and Winklhofer (2001), Claro (2004) and Scholten (2006).

### 5.4.1 Validity and reliability of formative indicator constructs

Formative indicator constructs have significant characteristics compared to reflective indicator constructs. Literature suggests that the guidelines for constructing indexes based on formative indicators are much harder to find compared to scale validation for reflective indicator constructs (Diamantopoulos and Winklhofer, 2001). However literature also indicates that four issues are critical for formative indicator constructs: content validity, nomological validity, convergent validity, and item multicollinearity. Figure 5.2 illustrates the validation procedures for formative indicator constructs.

*Content validity* is the adequacy with which the domain of a concept is captured by the measures (Churchill, 1979). This is particularly important because '*an index is more abstract and ambiguous than a latent variable measured with reflective indicators*' (Bagozzi, 1994). Because under formative measurement the latent variable is determined by its indicators and not vice versa, content specification is inextricably linked with indicator specification. Consequently, '*breadth of definition is extremely important to causal indicators*' (Nunnally and Bernstein, 1994), not least because failure to consider all facets of the construct will lead to an exclusion of relevant indicators and thus exclude part of the construct itself (Diamantopoulos and Winklhofer, 2001). The key to content validity rests in the procedures that are used to develop the measurement of a construct. Our study started by defining the domain of the concept. Reviewing literature is an important first step in defining the concept. The second step is to formulate a collection of items that broadly represents the variable as defined. In order to assure validity and reliability of the formative indicator constructs, we conducted a comprehensive literature search and tested the items during field interviews. In the exploratory case studies and the pre-testing phase of the questionnaire development, respondents helped us to refine the items and thereby to develop the measurements. This allowed us to select items that covered the entire scope of the latent variable as described by content specification. In further evaluating content validity, we also looked at the history of the scale. If the measurements performed well in related studies, this supported the scale's validity.

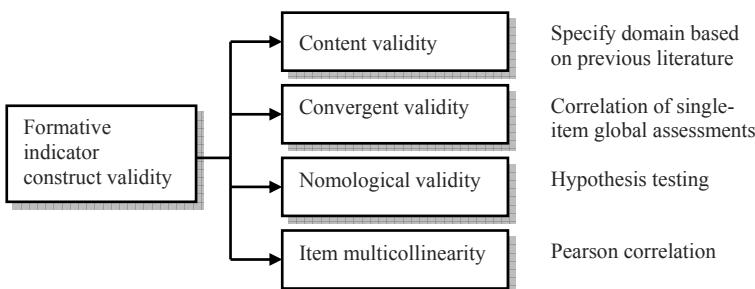


Figure 5.2. Procedure to assess validity and reliability of formative indicator constructs.

*Convergent validity* measures the extent to which the scale correlates positively with other measures of the same construct (Churchill, 1979). This test can also provide evidence of the validity of formative indicators (Anderson and Gerbing, 1988; Kumar *et al.*, 1998). We checked the correlations of single-item global assessments of the formative indicators with the respective composite score. The coefficients were greater than 0.50 and significant. This indicates the convergent validity of our constructs.

*Nomological validity*, also called criterion validity, is done during the model estimation. It is a comparison of scores on the scale of interest to the scores on other variables. Therefore, to assess nomological validity, we need to examine other variables that are effects of the latent variable (Bollen and Lennox, 1991). As suggested by Steenkamp and van Trijp (1991), we checked the nomological validity by testing the hypotheses about the relations between the formative construct of interest and other constructs. The extent that propositions hold informs us about their nomological validity for the formative indicator constructs.

*Item multicollinearity* was raised by Diamantopoulos and Winklhofer (2001) for the formative index construction. This is because the formative measurement model is based on a multiple regression (see Equation 5.2), and therefore the stability of the indicator coefficients ( $\lambda_s$ ) is affected by the sample size and strength of the indicator intercorrelations. Excessive multicollinearity among indicators makes it difficult to separate the distinct influence of the individual  $X_s$  on the latent variable  $\eta$ . Two issues are relevant in this context. First, given that each indicator coefficient,  $\lambda_p$ , shows the direct structural relation between  $X_j$  and  $\eta$ , the magnitudes of the  $\lambda_s$  can be interpreted as validity coefficients (Bollen, 1989); Thus high multicollinearity would render the assessment of indicator validity problematic. Second, if a particular  $x_i$  turns out to be almost a perfect linear combination of the other  $X_s$ , it is likely to contain redundant information and can therefore become a candidate for exclusion from the index (Bollen and Lennox, 1991). We examined the Pearson correlation<sup>22</sup> between the indicators of the constructs. Malhotra *et al.* (1999) suggested that correlations that lie below 0.80 are not considered to exhibit a problem of multicollinearity.

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<sup>22</sup> The Pearson correlation presents the magnitude and direction of the association between two variables in a data set (Malhotra *et al.*, 1999). It is an index used to determine whether a linear or straight-line relationship exists between the two variables. The correlation coefficient is a number between +1 and -1, which remains the same regardless of their underlying units of measurement. Calculation of the coefficient considers the mean and the standard deviation of the two variables in the sample (Churchill, 1979). The magnitude is the strength of the correlation. The closer the correlation is to either +1 or -1, the stronger the correlation. If the correlation is 0 or very close to 0, there is no association between the two variables. The direction of the correlation specifies how the two variables are related. If the correlation is positive, the two variables have a positive relationship (i.e. as one increases, the other also increases), whereas if the correlation is negative, the two variables have an inverse relationship (i.e., as one increases, the other decreases). The interpretation of the significant correlation coefficients are based on two-tailed t values of a 5% significant level ( $t > 1.96$ ).

### 5.4.2 Validity and reliability of reflective indicator constructs

The validity and reliability of reflective indicator constructs were assessed by following the procedures described by Anderson and Gerbing (1988) and Steenkamp and van Trijp (1991). Similar to the formative indicator constructs, content validity, convergent validity, discriminant validity, nomological validity, and reliability are important validating procedures for reflective indicator constructs. Figure 5.3 depicts the procedure to assess validity and reliability for reflective indicator constructs. Our methods to assess the validity of reflective indicator constructs are based on exploratory factor analysis, confirmatory factor analysis and Pearson correlations. For construct reliability, we computed the Cronbach's alpha, composite reliability and variance extracted for each construct.

The procedure of the reliability and validity of the reflective indicator constructs starts from the assessment of *content validity*. Content validity assesses the degree of correspondence between the items selected to constitute the construct (Hair *et al.*, 1998). In other words, content validity refers to the extent to which the measure reflects the domain of the concept. Previous literature is important to increase the content validity of a measure (Churchill, 1979). The procedure of content validity for the reflective indicator constructs are the same as that described for formative indicators at section 5.4.1. Content validity is supported when the measurement instrument has performed well in related research. Less-related research that used a similar concept can also be employed to adapt the measure to our study. In addition to a literature search, a pilot study with company interviews informs us how well the measures are held in our research.

*Convergent validity* refers to the extent to which the measure correlates with other methods designed to measure the same construct (Churchill, 1979). The item-total correlation and exploratory factor analysis were used to assess the convergent validity for reflective indicator constructs. The item-total correlation shows the correlation of one item of the construct with the sum of all of the other items for each construct. To obtain convergent validity, the threshold

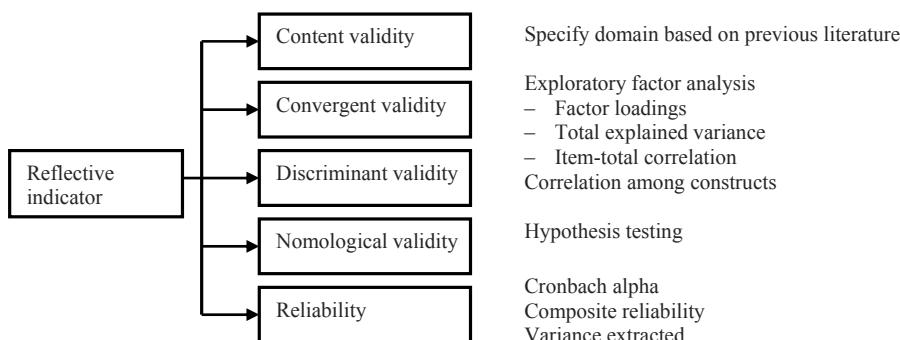


Figure 5.3. Procedure to assess validity and reliability of reflective indicator constructs.

value for the correlation is often set at 0.6 and is significant at a 95% statistical level. If the correlations value does not exceed the threshold, it means that the item has insufficient variance shared with other items of the construct. The item is then assumed not to be indicative of the construct and then should be removed (Steenkamp and van Trijp, 1991). Confirmatory factor analysis is conducted on the set of items to test whether the items are loading on one factor. If necessary, the number of items can be reduced by selecting only high factor loading items. In evaluating the results of the exploratory factor analysis, we looked at the total explained variance ( $>60\%$ ) and the factor loadings ( $>0.7$ ), both of which are appropriate for our sample size (Hair *et al.*, 1998).

The *Discriminant validity* measures the extent that an item is indeed novel and refers to the same constructs (Churchill, 1979). If the correlation between two conceptually different items is too high, they are probably measuring the same, rather than different, construct. Discriminant validity is achieved when low correlation exists between the items of interest and other items that are supposedly not measuring the same variable (Heeler and Ray, 1972). The measurement for discriminant validity can be done in two ways: first, in a correlations matrix of the constructs, the square root of the average variances extracted (AVE) should be greater than all correlations of the constructs; second, in a factor structure matrix of loadings and cross-loadings, all items should load more highly to its associated construct than to other constructs (Fornell and Larcker, 1981).

*Nomological (or criterion) validity* for reflective constructs assessment needs to examine other constructs that affect the focal construct (Bollen and Lennox, 1991). According to Churchill (1979), the measure should be tested to check whether it behaves as expected in relation to other constructs. The nomological validity is assessed with empirical data. In our research, when we checked the nomological validity when testing our propositions about the relations between the reflective construct and other constructs, the *t*-value showed the extent to which propositions are supported.

The *reliability* of the reflective indicator constructs refers to the extent that a set of indicators is consistent with what it is intended to measure. The Cronbach's alpha is typically employed to evaluate the construct reliability or the internal consistency of the measurement scale of a construct (De Vellis, 1991). The total variance among a set of items is partitioned into signal (i.e., true variation in the latent variable) and noise (i.e., error) components. The proportion of total variation that is signal equals alpha, and thus another way to think about alpha is that it is equal to 1 minus the error variance (Churchill, 1979). A low coefficient alpha indicates that the sample of items performs poorly in capturing the construct that motivated the measurement scale. Conversely, a large alpha indicates that the item test correlates well with the true variation. This coefficient then ranges from 0 to 1. Common practice is to accept scales with Cronbach alpha values of 0.7 or greater (Hair *et al.*, 1998).

Furthermore, several other measures are related to reliability, such as variance extracted, composite reliability, item-to-total correlation and inter-item correlation. In this research, we focus on the first two measures. The internal consistency measure of composite reliability was developed by Werts *et al.*, (1974). They argued that their measure is superior to Cronbach alpha since it uses the item loadings obtained within the nomological network (or cause model). In other words, in comparison with Cronbach alpha, composite reliability does not assume the equivalency among the measures with its assumption that all indicators are equally weighted (Chin, 1998). Nonetheless, the interpretation of the values obtained is similar, and the guidelines offered by Nunnally (1988) can be adopted for both. Specifically, Nunnally suggested 0.7 as a benchmark for 'modest' composite reliability for exploratory research (1988). Average variance extracted (AVE) measures the amount of variance that a latent variable component captures from its indicators relative to the amount due to measurement error. Fornell and Larcker (1981) suggested that this measure can also be interpreted as a measure of reliability for the latent variable component score and tends to be more conservative than composite reliability. It is recommended that AVE should be greater than 0.50 meaning that 50% or more variance of the indicators should be accounted for (Fornell and Larcker, 1981; Hair *et al.*, 1998). Furthermore, they also suggested that as a means of evaluating discriminant validity, the square root of the AVE of the latent variables should be greater than the correlations among the latent variables, which indicate that more variance is shared between the latent variables items than with another constructs. Both composite reliability and AVE are provided by PLS.

## **5.5 Data analysis methods: partial least squares<sup>23</sup>**

In this section, we describe the methods used for data analysis. In Chapter 3, we discussed the theoretical perspectives. After extensively reviewing the precedent literature, we propose the relationships between the concepts in Chapter 4. In this chapter, we will discuss the measurement of the concepts. We will test whether the hypothesised relations and causalities do occur in practice by estimating structural models in Chapter 7. Structural equation modelling (SEM) is the most applied and consolidated means of testing relations and causality in the field of marketing research (Steenkamp and van Trijp, 1991; Malhotra *et al.*, 1999; Steenkamp and Baumgartner, 2000). Recently, it is increasingly apparent that applying partial least squares (PLS)<sup>24</sup> shows advantages to SEM so as to appear in diversified business disciplines (Chin, 1998; Hulland, 1999; Brown and Chin, 2004). More details of PLS will be discussed in the following sections.

Partial least squares (PLS) regression (path) analysis is an alternative to ordinary least square (OLS) regression, canonical correlation or structural equation modelling (SEM) for analyzing dependent and independent variables. Although developed by Herman Wold (1981; 1985b)

<sup>23</sup> In this section, we introduce the PLS model based on Chin's work (1998). His constructive effort on PLS is therefore highly acknowledged.

<sup>24</sup> For a complete description of PLS see Fornell and Bookstein (1982).

for econometrics, PLS first gained popularity in chemometric research and later in industrial applications. It has since spread to research in education, marketing, management and the social sciences (Cool *et al.*, 1989; Fornell *et al.*, 1990; Johansson and Yip, 1994; Birkinshaw *et al.*, 1995; Hulland, 1999; Brown and Chin, 2004).

PLS is a predictive technique which can handle many independent variables, even when these display multicollinearity. PLS can also relate the set of independent variables to a set of multiple dependent variables. In PLS, one set of latent variables (LVs) is extracted for the set of observed independents and another set of LVs is extracted simultaneously for the set of observed dependent variables. The extraction process is based on decomposition of a crossproduct matrix involving both dependent and independent variables. The X-scores of the independent LVs are used to predict the Y-scores or the dependent latent(s), and the predicted Y scores are used to predict the observed variables. The X- and Y- scores are selected by PLS so that the relationship of successive pairs of X and Y scores is as strong as possible.

### 5.5.1 Model specification

PLS consists of three sets of relations: (1) the inner model, which specifies the relationships between the LVs; (2) the outer model, which specifies the relationships between the LVs and their associated observed or manifest variables; and (3) the weight relations upon which case values for the LVs can be estimated. Without loss of generality, it can be assumed that LVs and observed variables are scaled to zero means and unit variance so that the location parameters (i.e., constant parameter terms) can be eliminated in the following equations.

#### 5.5.1.1 Inner model

The inner model (structural model) can be formulated as:

$$\eta = \beta_0 + \beta\eta + \Gamma\xi + \zeta \quad (5.1)$$

where  $\eta$  represents the vector of endogenous (i.e., dependent) LVs,  $\xi$  is a vector of the exogenous (i.e., independent) LVs, and  $\zeta$  is the vector of residual variables (i.e., unexplained variance),  $\Gamma$  is the path coefficients matrix of the exogenous LVs.

The basic PLS design assumes recursive (i.e., one-way arrowed) relations among LVs, each dependent LV  $\eta_j$  is often termed as 'causal chain system' of LVs, which can be specified as follows:

$$\eta_j = \sum_i \beta_{ji} \eta_i + \sum_h \gamma_{jh} \xi_h + \zeta_j \quad (5.2)$$

where  $\beta_{ji}$  and  $\gamma_{jh}$  are the path coefficients linking the endogenous and exogenous LVs,  $\xi$  and  $\eta$  over the range specified by the indices  $i$  and  $h$ , and  $\zeta_j$  is the inner residual variable.

The inner model of Equation 5.1 is subject to predictor specification (Wold, 1988):

$$E(\eta_j | \forall \eta_i, \xi_h) = \sum_i \beta_{ji} \eta_i + \sum_h \gamma_{jh} \xi_h \quad (5.3)$$

Thus it is assumed that each LV is a linear function of its predictors and that there is no linear relationship between the predictors and the residual,

$$E(\zeta_j | \forall \eta_i, \xi_h) = 0 \text{ and } \text{Cov}(\zeta_j, \eta_i) = \text{Cov}(\zeta_j, \xi_h) = 0 \quad (5.4)$$

for the indices  $i$  and  $h$  ranging over all predictors.

### 5.5.1.2 Outer model

The outer model (also referred to as measurement model) defines how each block of indicators relates to its LV. The observed variables are partitioned into nonoverlapping blocks. For those blocks with reflective indicators, the relationships can be defined as:

$$x = \Lambda_x \xi + \varepsilon_x$$

$$y = \Lambda_y \eta + \varepsilon_y \quad (5.5)$$

where  $x$  and  $y$  are the observed variables for the exogenous and endogenous LVs  $\xi$  and  $\eta$  respectively.  $\Lambda_x$  and  $\Lambda_y$  are the loadings matrices representing simple regression coefficients connecting the LV and their measures. The residuals for the measures  $\varepsilon_x$  and  $\varepsilon_y$ , in turn, can be interpreted as measurement errors or noise.

Predictor specification, as in the case for the inner model, is assumed to hold for the outer model in reflective mode as follows:

$$E(x | \xi) = \Lambda_x \xi$$

$$E(y | \eta) = \Lambda_y \eta \quad (5.6)$$

For those blocks in a formative mode, the relationship is defined as:

$$\xi = \Pi_\xi x + \delta_\xi$$

$$\eta = \Pi_\eta y + \delta_\eta \quad (5.7)$$

where  $\xi$ ,  $\eta$ ,  $x$  and  $y$  are the same as those used in Equation 5.6.  $\Pi_\xi$  and  $\Pi_\eta$  are the multiple regression coefficients for the LV on its block of indicators, and  $\delta_\xi$  and  $\delta_\eta$  are the corresponding residuals from the regressions. Predictor specification is also in effect as:

$$E(\xi | x) = \Pi_{\xi} x$$

$$E(\eta | y) = \Pi_{\eta} y \quad (5.8)$$

As opposed to the weight relations to be discussed next, the formative specification for outer relations refers to the observed variables and the true LV. This, in turn, provide the basis for the manner in which the weights are determined within the PLS estimation algorithm estimating the LV.

### 5.5.1.3 Weight relations

Whereas the inner and outer models provide the specifications that are followed in the PLS estimation algorithm, we need, for completeness, to define the weight relations. The case value for each LV is estimated in PLS as follows:

$$\begin{aligned}\hat{\xi}_h &= \sum_{kh} w_{kh} x_{kh} \\ \hat{\eta}_i &= \sum_{ki} w_{ki} y_{ki}\end{aligned}\quad (5.9)$$

where  $w_{kh}, w_{ki}$  are the  $k$  weights used to form the LV estimates of  $\xi_h$  and  $\eta_i$ .

Thus the LV estimates are linear aggregates of their observed indicators whose weights are obtained via the PLS estimation procedure as specified by the inner and outer models, where  $x$  is a vector of the endogenous (i.e., dependent) LVs,  $\xi$  is a vector of the exogenous variables (i.e., independent) LVs,  $\zeta$  is a vector of residuals, and  $B$  and  $\Gamma$  are the path coefficient matrices.

### 5.5.2 Predictor specification

Predictor specification forms the basis for PLS modelling. The PLS approach does not make hard assumptions of a specific joint multivariate distribution and independence of observations as the covariance-based maximum likelihood estimation. PLS adopts the statistical assumptions for a linear conditional expectation relationship between dependent and independent variables, which can be summarised as:

$$\begin{aligned}y &= \alpha + Bx + v, \quad \hat{y} \equiv E(y | x) = \alpha + Bx \\ &\Rightarrow E(v) = 0 \\ &\Rightarrow Cov(x, v) = Cov(\hat{y}, v) = 0 \\ &\Rightarrow Cov(x, y) = Cov(x, \hat{y}) = B \text{ var}(x)\end{aligned}\quad (5.10)$$

where  $y$  and  $x$  are  $(m \times 1)$  and  $(n \times 1)$  matrices of dependent and independent variables,  $v$  is a  $(m \times 1)$  matrix of residuals, and  $B$  is the  $(m \times n)$  matrix of coefficient relations between  $y$  and  $x$ . The implications are that for a given  $x$  and  $y$ : (1)  $x$  is a predictor (cause or stimulus) of  $y$ ; and not the other way around (nonreversability); (2)  $\hat{y}$  is the systematic part of  $y$ , with respect to  $x$ ; and (3) the systematic part,  $\hat{y}$  is a linear function of  $x$ .

The observational or empirical representation of Equation 5.10 would follow simply by including the index  $n$  for observations 1, ...,  $N$ :

$$\begin{aligned}
 y &= \alpha + \beta x_n + v_n, \quad \hat{y}_n \equiv E(y_n | x_n) = \alpha + \beta x_n \\
 \Rightarrow E(v_n) &= 0 \\
 \Rightarrow \text{Cov}(x_n, v_n) &= \text{Cov}(\hat{y}_n, v_n) = 0 \\
 \Rightarrow \text{Cov}(x_n, y_n) &= \text{Cov}(x_n, \hat{y}_n) = \beta \text{var}(x_n)
 \end{aligned} \tag{5.11}$$

Therefore, it should be noted that identical distributions are not assumed. For any two cases, say  $n$  and  $n+1$ , no assumptions are made that the residuals  $v_n$  and  $v_{n+1}$  have the same distribution. Nor is independence of cases required because no specifications were made regarding the correlation between two different cases (i.e.,  $\text{Cov}[V_n, V_{n+1}]$ ). In general, a sufficient condition for consistency in least square (LS) estimates is that, as the number of observations go toward infinity, the sum of the correlations between cases must stay below infinity (i.e.  $\sum_i |\text{Cor}(v_n, v_{n+1})| < \infty$ , Wold, 1988).

Thus predictor specification can be viewed as an LS counterpart to the distributional assumptions of maximum likelihood modelling. It avoids the assumptions that observations follow a specific distributional pattern and that they are independently distributed. Therefore, no restrictions are made on the structure of the residual covariances, and under LS modelling the residual variance terms are minimised. In summary, Wold (1988) stated that predictor specification '*provides a general rational for (1) LS specification and (2) LS estimation, and thereby also for the application of (3) the cross-validation test for predictive relevance... and (4) the assessment of structural equations by Tukey's jackknife*', which are used for model evaluation.

### 5.5.3 Model evaluation

Because PLS makes no distributional assumptions (other than predictor specification) in its procedure for estimating parameters. Thus traditional parametric-based techniques for significance testing/evaluation would not be appropriate. Instead, Wold (1980, 1982) argued for tests consistent with the distribution-free/predictive approach of PLS. In other words, rather than based on covariance fit, evaluation of PLS models should apply prediction-oriented measures that are also nonparametric. To that extent, the  $R^2$  for dependent LVs and Fornell and

Larcker's (1981) AVE measure are used to assess predictiveness, whereas resampling procedures, such as jackknifing and bootstrapping, are used to examine the stability of estimates.

### 5.5.3.1 Explanatory power of structural models ( $R^2$ )

In assessing a PLS model, we can start by looking at the  $R^2$  for each dependent LV in the structural model. The interpretation is identical to that of traditional regression. The  $R^2$  is an indicator of how well the model fits the data (e.g. a  $R^2$  close to 1.0 indicates that we have accounted for almost all of the variability with the variables specified in the model). In other words,  $R^2$  is the fraction of the variance in the data that is explained by a regression (independent variables).

### 5.5.3.2 Jackknifing

In general, the jackknife is an inferential technique that assesses the variability of a statistic by examining the variability of the sample data rather than using parametric assumptions. The jackknife can be used to provide both estimates and compensate for bias in statistical estimates by developing robust confidence intervals. The general procedure of jackknife is to 'delete  $n$  cases' where  $n$  is typically 1. Parameter estimates are calculated for each instance and the variation in the estimates is analysed.

### 5.5.3.3 Bootstrapping

The bootstrap represents another nonparametric approach for estimating the precision of the PLS estimates.  $N$  sample sets are created in order to obtain  $N$  estimates for each parameter in the PLS model. Each sample is obtained by sampling with replacement from the original data set (typically until the number of cases is identical to the original sample set).

In comparing the bootstrap to the jackknife, you need to consider the trade-off between computation time and efficiency. Jackknife estimation tends to take less time for standard error estimation under the joint assumption. The bootstrap procedure, on the other hand, utilises a confidence estimation procedure other than the normal approximation. Thus the number of resamples is usually larger than those of the jackknife. Conversely, the jackknife is viewed as less efficient than the bootstrap (Efron and Tibshirani, 1993). In general, both the jackknife and bootstrap standard errors should converge. In the current study, we used bootstrap procedures. Following Chin (1998), we ran 500 samples.

### 5.5.3.4 Composite reliability

In assessing the internal consistency, we apply composite reliability (CR) of the construct. The CR was developed by Werts, Linn and Joreskog (1974). Using the normal PLS output, which standardises the indicators and LV, the CR is:

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum \varepsilon_i} \quad (5.12)$$

Where  $\lambda_i$  is the standardised loading coefficient of the path from the observed variables to the LV, and  $\varepsilon_i$  is error term. In comparison to Cronbach alpha, this measure does not assume the equivalency among the measures with its assumption that all indicators are equally weighted. Being a measure of internal consistency, composite reliability is only applicable for LVs with reflective indicators. It is suggested that the CR value of 0.7 and greater is reasonable for exploratory research (Nunnally, 1988).

#### 5.5.3.5 Average variance extracted

The measure of average variance extracted (AVE) was developed by Fornell and Larcker (1981). It attempts to measure the amount of variance that an LV component captures from its indicators relative to the amount due to measurement error. Assuming standardised indicators and LV estimates, the AVE can be calculated as follows:

$$AVE = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum \varepsilon_i} \quad (5.13)$$

where  $\lambda_i$  is the standardised loading coefficient of the path from the observed variables to the LV, and  $\varepsilon_i$  is error term.

It is recommended that the AVE should be greater than 0.50 meaning that 50% or more the variance of the indicators should be accounted for (Fornell and Larcker, 1981). Furthermore, the researchers suggested that as a means of evaluating discriminant validity, the square root of the AVE of the LVs should be greater than the correlations among the LVs, which indicates that more variance is shared between the LV component and its block of indicators than with another component representing a different block of indicators.

#### 5.5.3.6 Cross-loadings

Another test of discriminant validity for reflective indicator constructs can be achieved by calculating the correlations between LV component scores and other indicators besides its own block. If an indicator loads higher with other LVs than the one it is intended to measure, the researcher may wish to reconsider its appropriateness because it is unclear which construct or constructs it is actually reflecting. Furthermore, we should expect each block of indicators to load higher for its respective LV than indicators for other LVs.

## 5.6 Marketing channel choice analysis

The binary logit and multinomial logit models can be used to capture the effects marketing channel choice for vegetable farmers, processing and exporting companies and supermarkets. Personal and company characteristics, resource endowments, and natural and socio-economic factors are the basic factors determining the choice of market outlets. We assume that a farmer's or a firm's decision is generated based on his/its utility maximisation. Farmer or firm  $i$  ( $i=1,2,\dots,N$ ) evaluates each marketing channel alternative  $j$  ( $j=1,2,\dots,J$ ). Then, the farmer or firm compares his/its utility with each marketing channel  $U(U_1, U_2, \dots, U_J)$  and chooses the one that maximises his/its utility (Hensher *et al.*, 2005:82). The indirect utility function for the  $i$ -th farmer or firm for the  $j$ -th channel alternative is thus:

$$U_{ij} = x_i^\top \beta_j + e_{ij} \quad (i=1,2,\dots,N; j=1,2,\dots,J) \quad (5.14)$$

Where  $x_i$  denotes a vector of exogenous socio-economic farmer (firm) characteristics and other variables,  $\beta_j$  represents the vector of coefficients associated with the  $j$ -th market outlet and  $e_{ij}$  is a stochastic disturbance.

To depict farmers' or firms' choice of marketing channels empirically, we use multinomial logit model. The probability that farmer or firm  $i$  selects marketing channel  $j$  is equal to the probability that alternative  $j$  maximises his/its utility after evaluating each and every alternative in the choice set  $j=1,2,\dots,J$ . In notation,

$$\Pr ob(y_i = j) = \Pr ob(U_{ij} > U_{ik}) = \frac{e^{x_i^\top \beta_j}}{\sum_{k=1}^J e^{x_i^\top \beta_k}} \quad \text{for } j = 1,2,\dots,J \quad (5.15)$$

Where  $y$  represents the total choice set of marketing channels. It is assumed that  $U_{ij}$  is maximum among  $J$  choices. The equation for computing the marginal effects is as follows:

$$\frac{\partial P_j}{\partial x_i} = P_j (\beta_j - \sum_{k=1}^J P_k \beta_k) \quad \text{for } j = 1,2,\dots,J \quad (5.16)$$

where  $P_j$  is the probability for farmers choose market channel  $j$ . In our cases, farmers have four channels to sell vegetable, then  $J=4$ , and the alternatives  $j=1,2,3,4$  represent sale in the field, at the wet markets, at the wholesale market, and to processors or exporters respectively.

If  $j=2$ , then the previous defined models (Equation 5.14-5.16) are applied to binary logit model.

## **5.7 Concluding remarks**

Compared to the better known factor-based covariance fitting approach for latent structural modelling (such as LISREL, AMOS and EQS), the component-based PLS avoids two serious problems: inadmissible solutions (negative errors) and factor indeterminacy (rank and order conditions, Fornell and Bookstein, 1982). The philosophical distinction between factor and component based approaches is whether to use structural equation modelling for theory testing and development or for predictive applications (Anderson and Gerbing, 1988). In situations where prior theory is strong and further testing and development is the goal, covariance based full-information estimation methods (i.e., Maximum Likelihood or Generalised Least Squares) are more appropriate. However, due to the indeterminacy of factor score estimations, there exists a loss of predictive accuracy. For application and prediction, a PLS approach is often more suitable. With this approach, it is assumed that all the measured variance is useful variance to be explained. Since the approach estimates the LVs as exact linear combinations of the observed measures, it avoids the indeterminacy problem and provides an exact definition of component scores. Using the iterative estimation techniques of jackknife and bootstrap (Wold, 1981), identification is not a problem for recursive models; nor does it presume any distributional form for measured variables.

The advantages of PLS include ability to model multiple dependents as well as multiple independents; ability to handle multicollinearity among the independents; robustness in the face of data noise and (depending on software used) missing data; and creating independent latent variables directly on the basis of crossproducts involving the dependent variable(s), making stronger predictions. PLS can be a powerful method of analysis also because of the minimal demands on measurement scales, sample size, and residual distribution. PLS not only can be used for theory confirmation, but also can be used to suggest where relationships might or might not exist and to suggest propositions for later testing, which is coherent with the major purpose of this research.

However, PLS is also observed some shortcomings. Fornell and Cha (1994) discussed three properties of the estimators with PLS approach. First of all, the LV estimate in PLS is inconsistent. The case values of the latent variables are estimated as weighted aggregates of the corresponding blocks of indicators. These case values are inconsistent with measurement error (Wold, 1982, 1985a). Second, it is a well-known property of PLS estimates of loadings and structural coefficients that the LV relationships are biased, being overestimated and underestimated, respectively (Dijkstra, 1983; Wold, 1985a). The bias factors of loadings and LVs correlations can be reduced when the number of observed variables increases (Fornell and Cha, 1994). Third, the limiting behaviour of the PLS estimator was called '*consistency-at-large*'. Wold (1982) had proved that the estimate of the LV scores approaches 'true' LV scores as the number of indicators goes to infinity. In sum, the shortcomings of PLS approaches can be reduced as the number of cases in the samples increases and as the number of indicators increases.

# Chapter 6 Case study results

This chapter presents the case study results. By conducting case study in vegetable supply chains in Jiangsu Province, we expect to achieve at least three objectives. First, we want to seek distortions of the definitions chosen in this study based on the comments of case study participants. Second, we are going to verify the operationalisation of the constructs in measuring concepts. We ask case study participants if they have any problems in understanding the questions of each construct. The third objective of the case study is to provide insights into the content validity of the constructs.

In order for the sample to be represented, we carefully selected our cases from different areas (developed and less developed economic zones) in Jiangsu Province. Eight companies, one vegetable production company, two processing companies, two exporting companies, one vegetable cooperative, and two domestic supermarkets were interviewed. They represent the most important organisational forms in vegetable supply chains as indicated in Figure 2.3.

The interviews were conducted by the author in the interviewees' offices. The interview topics were based on a pre-designed case protocol<sup>25</sup>. Each interview lasted between 50 minutes and two hours. The interviewees had full knowledge about the company's marketing strategy and administration. Interviews ended with a small gift to acknowledge the cooperation and efforts of the interviewees.

The chapter starts with the description of the company profiles and the most important buyer-seller relationships of each company. Section 6.2 discusses the results of the case interviews in terms of the role of *guanxi* networks, the major concepts of buyer-seller relationships and market performance. Section 6.3 draws the main conclusions.

## 6.1 The basic information of the companies participating in the case studies

Table 6.1 provides the basic information and marketing strategies relating to the buying and selling behaviours of the interviewed companies.

The interviewees in the case study are general managers, CEO and vegetable sector managers. The case companies are rather young in terms of their establishment. The average establishment age is 5 years. The oldest case is the supermarket, which was set up in 1990. The youngest case is one of the processing companies, which was formed in 2003. The case companies are also

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<sup>25</sup> For a complete case interview protocol, see Appendix A.

*Table 6.1. The basic information of the case companies.*

<b>Characteristics</b>	<b>Cases</b>		
	<b>1) Production company</b>	<b>2) Processing company 1</b>	<b>3) Processing company 2</b>
Person(s) interviewed	General manager	General manager	General manager
Company established	2001	1999	2003
Number of employees	36	35	40
Sales scale (1,000 US\$)	100-500	400-500	200
Percentage of vegetable business (%)	100	100	100
Vegetable quality standards	Pollution-Free Food	Pollution-Free Food	Specified by buyers
Vegetable sources	n.a.	Vegetable farmers	Vegetable farmers and vegetable companies
Vegetable destinations	Supermarkets	USA, Japan, Canada, Australia, Netherlands, and Hong Kong	USA, Middle-East, and Supermarkets in China
Longest duration of sourcing and destination channels (years)	n.a./4	6	2

Source: Prepared based on field interviews of vegetable companies in Jiangsu Province, P.R. China, April - October 2005.

rather small in terms of their size. The average amount of employees for the case companies is 22 employees. The biggest company retains 40 employees, while the smallest one only has five employees. The total sales of the production company and the processing companies range between 100,000 and 500,000 USD. The supermarkets are the largest companies with total sales of over 1,000,000 USD. The exporting companies range in between with total sales of 500,000 to 1,000,000 USD.

Vegetable production companies, processing companies and cooperatives are all important forms in vegetable supply chains with a specialisation in the vegetable business, while exporting companies and supermarkets diversify their business into different sectors. As a newer form of vegetable market outlet, supermarkets only devote less than 10% of total sales to vegetable

4) Exporting company 1	5) Exporting company 2	6) Cooperative	7) Supermarket 1	8) Supermarket 2
CEO & General manager	General manager	General manager	Deputy general manager	Manager for fresh sector
1998	1999	2001	1990	1999
7	5	28	10	15
500-1000	500-1000	500-1000	>1000	>1000
40	30	100	<5	10
Specified by buyers	Specified by buyers	Pollution-Free Food	Pollution-Free Food and Green Food	Pollution-Free Food
Vegetable companies	Vegetable companies	Vegetable farmers	Vegetable farmers and production site	Vegetable company, farmers and wholesale markets
USA, Germany and Japan	Japan, Korea and Singapore	Wholesale markets, supermarkets and vegetable companies	Consumers	Consumers
7	6	4	10/15	6

selling. Pollution-free quality standards are implemented by most of the case companies. Some companies, especially the exporting companies, indicated that the quality standards are specified by their buyers. Although most of the case companies are recently developed, they all have a long-term strategy. Most of the companies indicated that they still maintain business relationships with their business partners from the first year.

Interviewed case companies all showed significant differences for their sourcing and selling strategies. Their sourcing channels are focused on vegetable farmers, domestic vegetable companies and wholesale markets. Their destination channels, on the other hand, are concentrated on supermarkets, international markets and consumers. Five typical vegetable supply chains with different buyer-seller relationships will be discussed detail below.

Vegetable production company (case 1): This vegetable production company owns an advanced greenhouse imported from the Netherlands to produce limited varieties (pepper, Holland cucumber and tomato). This company promises to produce high-quality vegetables with high productivity level. All vegetables from this company are delivered to local supermarkets (relationship 1 in Figure 6.1). This company has well built long-term relationships with different supermarkets in Jiangsu Province. The company delivers all vegetables to supermarket outlets directly using a cooling truck. Annually contracts are signed to regulate their transactions. Payments, quality requirements and delivery condition are fixed in the contracts. Prices are monthly determined based on market price, while the daily delivery volume is based on daily order. Pollution-Free Food quality standards are applied in this producer-supermarket chain.

Vegetable processing company (case 2 and 3): The two processing companies have similar sourcing and destination channels (Figure 6.2). They buy fresh vegetables mostly from local vegetable farmers (relationship 2 in Figure 6.2), and only partly buy processed vegetables from domestic food companies during the supply shortage (left dash line). The international markets are the major destinations for their processed products (fresh and frozen vegetables, processed vegetables such as dried vegetables) to pursue high profits with large quantities (relationship 3 in Figure 6.2). They also sell part of their produces, mostly second class quality products, either to domestic food companies or supermarkets in domestic markets (right dash line).

During the interviews, we found that *guanxi* networks were more important for processing companies in international markets than in domestic markets. Formal contracts are often used for purchasing vegetables from domestic food companies and selling final products to international markets. There are no formal contracts for transactions with small-scale farmers, only in certain cases, informal (oral) agreements occur. It is important to mention that *guanxi* is an important factor to enhance and lubricate transactions in international markets although

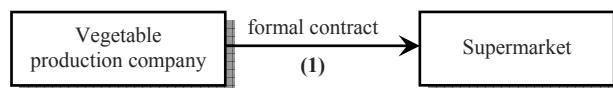


Figure 6.1. Vegetable flow of the production company chain.

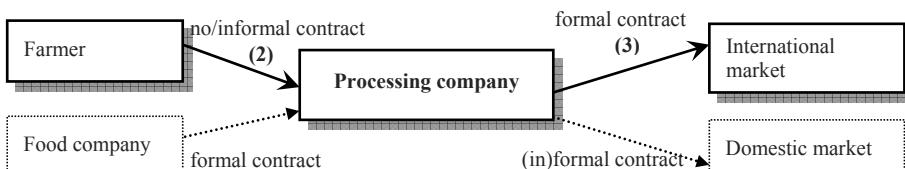


Figure 6.2. Vegetable flow of the processing company chain.

they have contracts with their buyers. Vegetable quality is based on each buyer in international markets. Pollution-Free Food, Green Food and in some cases, Organic Food is required by international buyers.

Vegetable exporting company (case 4 and 5): The two interviewed exporting companies use similar vegetable sourcing and destination markets. Both of them buy processed vegetables (fresh, frozen and dried vegetables) from domestic food companies and sell to international markets (relationship 4 and 5 in Figure 6.3). As trading companies, they did not invest for their own produce and processing facilities, but they put lots of efforts to acquire produce and marketing information. They also train employees to seeking right products effectively and sell the products efficiently and profitably. Thus exporting companies incur high level of training costs and information costs.

Formal contracts are widely used in their purchasing and selling activities (relationship 4 and 5). Similar as processing companies, *guanxi* is also an important influencer for the transactions in international markets. Pollution-Free Food or Green Food is required by the international buyers.

Vegetable cooperative (case 6): The vegetable cooperative in this research has single vegetable source and diversified destinations in domestic markets (Figure 6.4). The cooperative is fully responsible for its members' vegetable sale. Formal contracts and the cooperative membership indicate their buyer-seller relationships (relationship 6). Pollution-free vegetables are required



Figure 6.3. Vegetable flow of the exporting company chain.

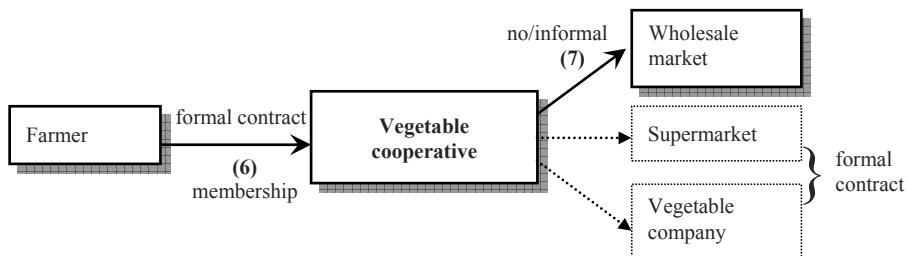


Figure 6.4. Vegetable flow of the cooperative chain.

by the cooperative. The major markets for the cooperative's vegetables are domestic wholesale market (relationship 7). The cooperative also sells part of vegetables to supermarkets and domestic vegetable companies. Contracts are used in the transactions with supermarkets and vegetable companies while cash payments are popular in the wholesale market.

Supermarket (case 7 and 8): The two interviewed supermarkets have different strategies for their vegetable business (see Figure 6.5). Supermarket 1 had a long time experience but still showed lack of knowledge for vegetable sector operations. It started to purchase vegetables from state-owned vegetable company, but it failed after several years' of cooperation. Then it turned to purchase vegetables from different sources. Leaf vegetables were mainly bought from local farmers or farmer associations (relationship 8) and local specified vegetable production sites (farmer based) to promise freshness and high quality. Part of leaf vegetables were also bought from the wholesale market to guarantee large quantities demand. Supermarket 1 also purchased long shelf-life vegetables from long-distance production sites. This diversified sourcing strategy showed positive results for supermarket 1 so far. Supermarket 2, however, had another way to arrange its vegetables. It started with central purchasing strategy. All the vegetables were purchased from a vegetable company based in Shanghai (relationship 9). Recently, supermarket 2 also bought some specific varieties from local farmers and wholesale markets with small volumes. Both supermarkets use contracts to regulate their transactions. Results showed that both sourcing strategies are rather successful so far.

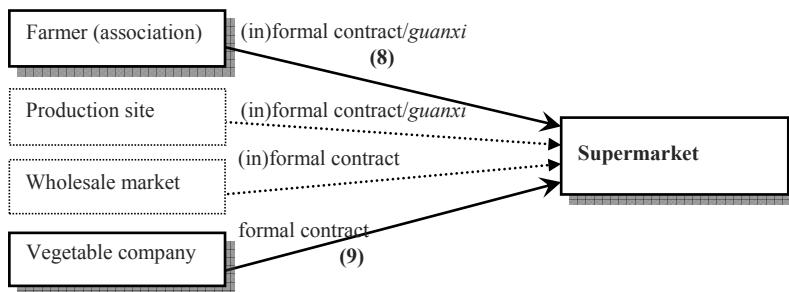


Figure 6.5. Vegetable flow of the supermarket chain.

## 6.2 Case study results

### 6.2.1 Guanxi networks in vegetable supply chains

The case studies showed that the vegetable related companies use various personal relationships, called *guanxi* in China, to help them build up business relationships. Their family *guanxi* and friend *guanxi* show positive effects on their business development. Family members may

occupy an important position in the company. This is because the private company normally started with joint investments from family members and/or with close friends. So the owners feel confident and trusted to work with their family members.

Friend *guanxi* also matters for company business. The friends here can be own friends, friends of the friends, classmates, etc. Friendship is very important for the companies' business. Marketing information, managing knowledge and capital investment are the major help from friend networks. 'We do business with friends'. Chinese people trust friends while keeping distance with strangers.

*'My nephew is the general manager of my company and I trust him. He also showed a good performance for the last several years in developing markets and in general administration. His inspiration and innovation ideas help my company to grow fast and to be the leader in vegetable industry in Jiangsu Province. I trust him not just because he is my nephew, but also he is young and creative.'*

*'We had a very big guanxi network to help us start our business and expand our markets. When I started my company, I got all kinds of help from my friends, including market information, managerial knowledge, customer information, and capital investments.' 'You cannot do everything by yourself; you have to ask for help from others.'*

Interview with exporting company 1.

The most important *guanxi* for the companies' business was so-called business *guanxi*. Nearly all the companies said that they will carefully and sincerely deal with their business partners. The international customers are so important to a company because of the difficulties of finding and maintaining business relationships with them. Buyers are the guarantee of the business success. Therefore, you would not want to lose any of your business relationships.

*'My business guanxi networks are my most important treasures; I have to rely on them to continue my company. But they are so difficult to fully rely on them same as my family member or close friends, we still should keep distance with them, but for sure we cannot lose them.'*

Interview with processing company 1.

*Guanxi* networks have significant impacts on companies' business, especially for their marketing development. Nearly all the companies agreed that their *guanxi* networks help them to start their business in terms of searching market information, finding new buyers or accessing new markets etc. Once the contact person moved to another company, they still can keep relationships with him, so that they can extend their business relationships with a new company, maybe even move to a new market.

## 6.2.2 Trust

Processing and exporting cases showed that *guanxi* networks increase interpersonal trust. This may be because of both the processing and exporting companies have long-term relationships with their buyers, and their previous business experiences develop mutual trust. Telephone contact and personal visits also increase trust. Companies often mentioned that trusting their customers is the most important factor to maintain and coherent their business relationships and to improve their performance.

Trust increases with a good business experience. Most of the companies said that it is difficult for them to fully trust a customer for the first transaction. They get to know the reputation of this customer via their *guanxi* networks before the formal business negotiation starts. A small quantity trial transaction is another common solution for most of the companies which allows a constructive relationship to develop future deals is very important for the international business both for sellers and buyers. Based on successful prior experiences, reputation was built up.

Good reputation increases trust. The companies are willing to keep their reputation to each customer because of the transferability and transparency of *guanxi* networks. Any opportunistic behaviour to any customer may lead to the reputation damage within the whole *guanxi* networks. So people like to trust those who with good reputations.

Trust changes the way of business transactions. Trust is the most important factor influence companies' behaviour. Due to the uncertainty and high risk in the international business, nearly all the transactions are conducted under Letters of Credit (L/C) which is issued by the authorized bank with a high commission charge. So L/C incurs a high transaction costs to buyers and sellers and it takes a long period to complete a transaction. But it is rather safe both for buyers and sellers. With the increasing of trust, a new, faster and cheaper method, Telegraphic Transfer (TT), was preferred in transactions. TT allows buyers to pay after they receive the goods. So it implies higher risk for sellers compared to L/C. But TT is a very convenient way to conduct transactions with low costs.

*'We are not going to do wrong thing to cheat our customers, we have to keep our reputation to them, otherwise, we will not only lose this customer but also lose the entire market in this region.'*

*'We trust our customers because we had a happy transaction experience; we believe they will be honest to us in the future as well.'*

Interview with exporting company 1 and 2.

### 6.2.3 Transaction specific investments

Transaction specific investments are required for the company to be involved in the vegetable industry. Both physical and human investments are required. Case interview showed that *guanxi* network can influence companies' behaviours in terms of transaction specific investments. Most of the companies agreed that they got requests from their buyers regarding investment to improve food quality and safety. The decision will be made depend on the expectation of the future business chance with this buyer. One processing company plans to invest a new production line called Frozen Drying (FD). FD is a new technology to dry vegetables at low temperature. Vegetables with FD technology retain most of the nutrition (less nutrition was destroyed during drying process). Therefore, the quality of processed vegetables is high. This investment was suggested by its buyer with promise to keep long-term business relationships with the processing company which encourages the company to make this specific investment.

Transactional specific investments make buyer-seller relationships closer. The physical investments are the equipments and machineries for processing and packaging which is crucial to improve product quality. Equipments (such as cooling vehicle) to transport products also facilitate deliveries from the suppliers' location to the warehouse of the company or directly to the retailers' shops. Companies perceived transaction specific investments as improving the relationship with buyers and to enhance the transactions in the future. The interviewed vegetable production company recently invested large-scale greenhouse imported from The Netherlands and started to produce high-quality vegetables which are sold to supermarkets. The FD processing line and the greenhouse are rather expensive. The investment decisions are made based on *guanxi* networks and the expectation for future business opportunities. The processing company tends to invest in FD because it has a good relationship with the buyer and it believes that the FD investment will further enhance their relationships and improve their market performance. The production company invested in the greenhouse made it possible to build up long-term buyer-seller relationships with supermarkets.

*'The greenhouse is a huge investment for us. But it helps us to negotiate with supermarkets. They show confidence with our product quality and we can easily make a deal and access to more markets.'*

Interview with production company.

*'We are going to invest a Frozen Drying (FD) line based on the suggestion from our buyer. FD is a new technology in vegetable processing industry. With this technology, we will become a leader in terms of technology. We can produce high-quality dried vegetables for international markets and keep long-term business relationships with my buyers. We believe this investment is worthwhile though it is very expensive.'*

Interview with processing company 1.

Human specific investments are mainly focused on knowledge training and transfer. It is important to train sales representatives to get familiar with international rules and the commercial skills to deal with foreign customers. It is also important to know the significant different cultures in different markets. Interviews showed that knowledge training for employees is an important investment for gaining efficiencies. The buyers should have knowledge about where they can find the right product with a competitive price. The way of contact with foreign customers is totally different from the way of communication with domestic customers. Nearly all the companies highlighted the importance of human investments to decrease conflicts with customers and to benefit relationship building.

The fast development of internet displayed its value for business. Most of the vegetable companies have experiences in doing business via the internet. They release supply information, search for demand information and conduct transactions through the internet. Companies introduce their profiles, products and even culture on the internet. A good website design can present the company to its potential customers. One processing company mentioned that they have very good business relationships with French buyers because they have a French language webpage on their company's website.

The internet construction is also another important physical investment for the company. It is a good and reliable media to introduce the product, management, experts, company culture to their customers. *'We launched a French version website this year when we had a French girl do internship in our company. It is a good way for us to keep close contact with our French customers especially.'*

Interview with processing company 2.

### 6.2.4 Channel and governance choices

Vegetable companies (processing and exporting companies and supermarkets) have significant different marketing strategies regarding their channel and governance choices. For their buying behaviour, most of the companies try to concentrate on preferred suppliers to acquire consistent product quality. For their selling behaviour, multiple channel strategy is applied for security reason. Both formal and informal contracts are used for transactions.

Companies try to keep regular contacts and long-term relationships with their customers. They mostly keep several preferred customers for their entire business. The businesses relationships will not be stopped if there is no serious problem. Nearly all the case companies kept their longest relationships since they set up their company. Companies also showed tendency to diversify their sales markets. They try to keep rather more buyers compared to suppliers. But several important buyers are still preferred to guarantee minimum transactions. But they will never stop searching new buyers to achieve business development.

Except for the exporting companies and the production company, all case companies have direct contacts with vegetable farmers, either individual farmers or farmer associations. In doing so, they can shorten supply chains and reduce lead time to keep vegetables fresh. Informal contracts or *guanxi* are popular in transactions with farmers. In terms of the transactions with farmer associations, formal contracts prevail.

Contracts are the basic governance mechanism for all international transactions due to security reasons while their *guanxi* networks make a role to enhance and lubricate these transactions. Companies' *guanxi* networks showed positive contribution to international business. *Guanxi* networks increase problem tolerance and improves problem solving. *Guanxi* networks also increase rebuy possibilities and extends business durations.

*'We try to keep long-term relationships with one of our most important vegetable suppliers to guarantee our major demand. We also keep regular contacts with other suppliers to reduce supply risk. We have yearly contract with the village in Nanjing. Varieties, quality, delivery condition, etc. are lined up in the contract. Prices are determined every week for fluctuation reasons. The daily orders are made through telephone, fax or email.'*

Interview with the supermarket 1.

Payment method is very important as indicator for *guanxi* and trust. Security is the major concerns for international transactions. The sellers not only evaluate the reputation of the international buyers, they also use less risky methods to conduct transactions, such as L/C. But it will be replaced by a more risk-taking methods (TT) once they build a good relationship and trust each other. However, transaction with cash payment is more often used in domestic markets. In doing this, buyers can get a lower price to acquire a high margin. Companies also contact traders/middlemen to reduce collecting costs in domestic markets. Contacting with farmer associations is a common way. General contracts are used to regulate the transactions. Quality, delivery time and place, and price are the most important items in the contracts. Stable delivery and consistent quality are the important judging criterions.

## 6.2.5 Performance

Case interviews showed that building strong *guanxi* relations with the right person is important to achieve business success in China. *Guanxi* networks determine the companies' marketing strategies in terms of marketing channel and governance choices and consequently, affect the companies' market performance regarding profitability, quality satisfaction and efficiency.

### 6.2.5.1 Profitability

Profit is the major concern for all business transactions. The case study showed that the companies with long-term market orientation have a good profit strategy. This is because the

companies want to grow along with the development of their customers, and they focus on long-term transactions instead of a high profit margin. 'We only keep contact with the same customers. Thus we can achieve expected profits since our customers are doing well in their business'. *Guanxi* networks contribute to the profit. The companies also incur considerable costs to develop and maintain such *guanxi* networks. Dining and wining, thanksgiving gifts and paying back favours are all costly activities in *guanxi* networks. All these increase the costs in business transactions. However, interpersonal trust can reduce transaction costs drastically.

#### **6.2.5.2 Quality satisfaction**

Quality satisfaction is the result of the delivered product quality compared to quality expectation. International buyers require higher quality products than in domestic markets according to their own quality standards. Chemical residuals are major safety concerns for buyers. HACCP and ISO certification implies quality guarantee to convince buyers. In this regard, companies have to offer their best quality products to international markets and deliver the second-class quality products to domestic markets. This diversified quality management practices lead to different quality images. Case studies showed that the quality image is higher in international markets than in domestic markets. *Guanxi* networks show positive impacts on the quality perception. Good *guanxi* improves quality management practices and reduces quality problems both in buying and selling stages which results a high level of quality satisfaction.

#### **6.2.5.3 Efficiency**

Vegetable farmers can achieve efficiency if they are able to comply with the buyer's requirements regarding delivery conditions and transaction agreements. Efficiency will be further enhanced with large production scale, better quality of seeds and higher investment in transportation facilities. For vegetable companies, however, the efficiency can be achieved by having good personal relationships with vegetable suppliers and long experience in vegetable business. *Guanxi* networks improve efficiency in terms of transaction measurements such as the time and efforts involved in business transactions. Farmers and companies can obtain necessary information regarding business opportunities and transaction partners through personal *guanxi* networks, which may largely reduce the amount of time and efforts needed for starting and maintaining a business relationship.

### **6.3 Conclusions**

The objective of this study is to analyse governance mechanisms that support market performance in Chinese vegetable supply chains. We particularly investigate the effects of the Chinese cultural and social embedded *guanxi* networks as an informal governance mechanism on buyer-seller relationships and market performance in vegetable supply chains. We interviewed eight case companies in Jiangsu Province to explore the relationships of

*guanxi* networks, trust, transaction specific investments, channel and governance choices, and performance attributes of profitability, quality satisfaction and efficiency. Summaries of the selected nine buyer-seller relationships of the eight case companies (Figure 6.1 – Figure 6.5) are listed in Table 6.2.

This case study demonstrated that *guanxi* networks have diversified contributions to buyer-seller relationships involved in various vegetable supply chains in Jiangsu Province. *Guanxi* networks significantly affect company-based transactions. This is because *guanxi* networks are very important for collecting reliable market information, improving trust and eventually stimulating transaction specific investments. *Guanxi* networks, on the other hand, have limited impact on individual- (farmer-) based transactions. This case study demonstrated that interpersonal trust and TSI are generally high in selling behaviour while rather low in purchasing behaviour. The sellers are more interested in and relying on *guanxi* networks in general, while the buyers are not. This may be because the companies have much less problems in buying required products from domestic markets than selling products to highly competitive markets like international markets. High levels of trust and TSI are required and are helpful to improve buyer-seller relationships with their customers. This finding is consistent with Claro's (2004) work. Case companies behave differently in purchasing and selling markets in terms of the use of *guanxi*, interpersonal trust and TSI, which should be taken into account when we study buyer-seller relationships in China.

The case study also showed that the companies that comply with buyers' requirements regarding quality standards and delivery conditions achieve a good market performance. With internationalisation, companies tend to expand their businesses into international markets. Requirements for vegetable quality and delivery conditions are rather high in international markets. Due to the high risks involved, formal contracts prevail in international markets. Farmers, on the other hand, have opportunities to deliver their vegetables to either traditional markets or emerging market outlets like supermarkets. Quality and delivery requirements differ widely in domestic markets. Quality and delivery requirements are rather low in traditional markets such as wholesale markets; while they are very high in emerging markets. Due to high monitoring and enforcement costs, informal arrangements, such as oral contracts or *guanxi* prevail in transactions with individual farmers.

A general conclusion from this case study is that the governance mechanism for vegetable transactions in Jiangsu Province is not only associated with transaction specific investments, but also closely associated with *guanxi* networks and interpersonal trust. Consistent with transaction cost economics, higher transaction specific investments in business lead to contract-based (formal) transactions. Well-developed *guanxi* networks and high level of interpersonal trust also lead to contractual transactions. The positive relation between *guanxi* networks and contractual governance implies a complementary effect of the informal governance on formal governance. The complementary (while not substitute) effect of *guanxi* networks and interpersonal trust on contractual governance should be explained within a Chinese context

Table 6.2. Summary of the concepts for different buyer-seller relationships.

Constructs	Sourcing buyer-seller relationships			
	Farmer – processor	Food company – exporter	Farmer – cooperative	Farmer – supermarket
	(2)	(4)	(6)	(8)
Guanxi networks	limited	important	limited	limited
Trust	low	low to middle	low	low
Transaction specific investments	low	low	low	low
Governance mechanisms	informal contract	formal contract	cooperative membership	(in)formal contract
Compliance with quality and delivery requirements	middle to high	high	low to middle	middle to high
Transaction costs	high	low	high	high
Profitability	middle	middle	middle	high
Quality satisfaction	low	high	low	low
Efficiency	low to middle	middle to high	middle to high	middle to high

Source: Prepared by the author based on case interviews.

from historical and cultural perspectives (see details in Section 3.3.2). We will further discuss this with empirical analysis in Chapter 7.

Transaction costs in vegetable transactions close related with trust and reputation in buyer-seller relationships. *Guanxi* accelerate problem solving and increase problem tolerance in relationships with international customers which enhance long-term business success. Transaction costs in international markets are lower than in domestic markets for higher level of trust and creditability of reputations which lead to less information and enforcement costs. As a results, international business is perceived as efficiency and high profitability. Transaction costs with individual farmers at domestic markets are high which lead to inefficient transactions with low profitability. This case study showed that profitability and efficiency can be improved with the support from personal *guanxi* networks. However, the costs for building and maintaining such *guanxi* networks are inevitable and thus reduce the profitability.

Market performance differs in different buyer-seller relationships. Product quality requirements are much higher in international markets and emerging domestic markets than those in

**Selling buyer-seller relationships**

<b>Vegetable company – supermarket (9)</b>	<b>Production company – supermarket (1)</b>	<b>Processor – international market (3)</b>	<b>Exporter – international market (5)</b>	<b>Cooperative – wholesale market (7)</b>
important high high	important middle to high high	important high high	important high high	limited low high
formal contract	formal contract	formal contract	formal contract	(in)formal contract
middle to high	middle to high	high	high	low to middle
low high high high	low high high high	low high high middle to high	low high high high	high low low low to middle

traditional domestic markets. The companies deliver good quality products to international markets and poor quality products to traditional domestic markets, creating good quality images in the international markets. Long-term business relationships improve the mutual understanding and provide possibilities to solve conflicts. Good business experience increases the satisfaction of buyer-seller relationships. Companies with well-developed *guanxi* networks can be trusted more. Thus good *guanxi* networks lead to better business performance.

Finally, in the presence of cooperatives (or associations which is widely called in China), small-scale farmers can expand their *guanxi* networks greatly. The cooperative, acting as an intermediary organisation to resolve the issue of efficiently aggregating products over many small-scale farmers, will be key to help smallholders to enter into the relations with emerging modern domestic market outlets (such as processing companies and supermarkets) and international markets. As a member of the cooperative, farmers can market their products jointly, thus increasing their supply capacity, which is often recognised as the major constraint for individual farmers. Cooperatives increase the smallholders' capacities to apply new production technology and to implement high quality standards. Cooperatives also enhance

the marketing power (such as negotiation power) of smallholders. The cooperative case in this study collects vegetables from each individual member, and sells to the supermarkets, wholesale markets and domestic food companies to achieve a good market price and a stable market demand. Being a member of the cooperative, farmers can be free from marketing issues. They can put all their effort in vegetable production and produce high quality vegetables with high productivity.

# Chapter 7 Survey results

This chapter presents the empirical results of the questionnaire survey in Jiangsu Province. Two samples (the farmer sample and the buyer sample) are evaluated and analysed separately. The farmer sample is composed of 167 relationships that the vegetable farmers have with their buyers; the buyer sample (including processing companies, exporting companies and supermarkets) is composed of 84 relationships that the buyers have with their vegetable suppliers and 92 relationships (including 8 production companies) that they have with their vegetable customers<sup>26</sup>. Data management and the preliminary evaluation of the samples are performed with SPSS (version 12.0.1). The statistical analysis and proposition test are carried out by Partial Least Squares (PLS, version VisualPLS1.04b) for structural model analysis and by Stata 9 (Special Edition 9.2) for marketing channel choice analysis.

This chapter starts from the description of the samples in Section 7.1. Section 7.2 and Section 7.3 discuss the validity and reliability of the formative and reflective constructs respectively. Section 7.4 presents the conceptual research model. Three different types of buyer-seller relationships are separately analysed. The model for the farmer sample is presented in Section 7.5. The models of buyer-seller relationships with upstream and downstream partners for the buyer sample are discussed in Section 7.6 and 7.7 respectively. In Section 7.8, we investigate the factors determining marketing channel choices by multinomial and binary logit models. This chapter ends with the concluding remarks.

## 7.1 Description of the study samples

This section describes the general characteristics of the study samples. As indicated earlier, data were collected based on personal interviews. Thus a high response rate was achieved. Most of the contacted companies accepted an interview. Only very limited number of companies (less than 10) were not able to be interviewed.

### 7.1.1 Characteristics of the vegetable producers

Vegetable production and marketing involve multiple players throughout the chain. The vegetable producers consist of one of the most important parties in the chain. Table 7.1 provides the demographic characteristics of the vegetable producers.

During the field interview, we found that males and females are almost equally engaged in vegetable production activities in most of the farm households. In some cases, farmers

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<sup>26</sup> We interviewed eight vegetable production companies that only function as suppliers. They are therefore included in the analysis of buyer-seller relationships with downstream partners.

**Table 7.1. Personal characteristics of the interviewed vegetable farmers.**

<b>Personal characteristics</b>	<b>Mean (S.D.)</b>
Sex (male=1, female=0)	0.57 (0.50)
Age (year)	52.43 (10.48)
Education level <sup>a</sup>	1.20 (0.91)
Family members (number)	4.06 (1.63)
Skill <sup>b</sup>	3.90 (0.66)
Vegetable production experience (years)	22.03 (12.62)

<sup>a</sup>0=illiteracy, 1=primary school, 2=middle school, 3=high school, and 4=above high school

<sup>b</sup>1=very bad, 2=bad, 3=average, 4=good, 5=very good

Note: Standard deviations are in the parentheses.

Source: own survey.

responded that males are more responsible for sales than for production activities due to the heavy transportation loads.

Vegetable farmers in Jiangsu Province are older in ages and less educated. The average age of vegetable farmers is more than 52 years. Less than 15% of the vegetable farmers are younger than 40 years, and 20% of the vegetable farmers are older than 60 years. The oldest producer that I interviewed is 88 years old, and the youngest is 24 years old. In terms of education, most vegetable farmers had primary education. One quarter of the vegetable farmers are still illiterate, and only less than 10% have high school education.

Vegetable production is a traditional farming activity. The average vegetable production experience of vegetable farmers is about 22 years. Less than 10% of the vegetable farmers have less than 10 years of production experience. Because of their long production experience, about 90% of the vegetable farmers indicated that their production skills are good or very good. The average family consists of four persons, but in most of the families only the elder members are engaged in vegetable production, while the younger generation are involved in nonfarm employment. This may be due to the high education level of the younger generation and the decline profit of the vegetable production.

Table 7.2 shows the resource endowments of the vegetable farmers. In Jiangsu Province, farm production scale is rather small, while farmers are specialised in vegetable production. The total farmland was about 0.2 ha per household in 2004. On average, 86% of the total farmland was used for vegetable production. With the development of industrialisation and urbanisation, more and more farmland is converted into industrial and urban use. As a result, less and less farmland is available for vegetable production. During the fieldwork in Nanjing

Table 7.2. Resource endowments of the vegetable farmers, mean and (S.D.).

	2001	2004
Total farmland (ha)	n.a.	0.21 (0.15)
Farmland for vegetable production (ha)	0.19 (0.14)	0.18 (0.14)
Yield (USD/ha)	6,712.95 (3784.08)	6,970.62 (4019.06)
Investment level (USD/ha•year)	2,155.4 (2146.4) <sup>2</sup>	1,919.5 (1352.4)
Working time per day (hours)	n.a.	9.0 (2.39)
Quality of the farmland <sup>1</sup>	n.a.	4.06 (0.59)

<sup>1</sup>Five-Likert scale was used to indicate the quality of the farmland, 1=very bad, 2=bad, 3=average, 4=good, 5=very good

<sup>2</sup>These data comes from the survey with 86 farmers in the same area in 2002.

Source: own survey.

City, all farmland in one of the villages has been planned for industrial use. The farmers in this village will lose their land and be forced to look for nonfarm employment. This phenomenon is rather common in China nowadays. More and more farmers are losing their farmland and their farmer identity.

The average yield of vegetable production in Jiangsu Province was 6,970 USD per ha in 2004, increased about 4% in the last three years. The average investment in vegetable production in Jiangsu Province was about 1,919 USD per ha in 2004,<sup>27</sup> decreased about 10% in the last three years. One-third of the vegetable farmers only invested half of this average in vegetable production, while still 10% of the farmers invested more than 4,000 USD per ha. As vegetable production is a labour-intensive activity, the working time is rather long. The average daily working time is about nine hours per labour, including the time working in the field and the time selling vegetables at the markets. The quality of the farmland is valued as good in Jiangsu Province (4.06).

Table 7.3 provides the vegetable farmers' market choice in Jiangsu Province. Multiple market outlets are available. Vegetable farmers can directly sell vegetables to consumers at the wet markets, and deliver vegetables to traders either at the field or at the wholesale markets. Recently they can also sell vegetables to processing companies. These market outlets have different characteristics regarding market share, market experience, market distance, sales frequency and sales time. We compare the means for each market outlet with the means of the processing company market chain. The characteristics with significantly different means

<sup>27</sup> In the questionnaire, the currency used was the Chinese yuan, 1USD=8 yuan; measurement unit for area was mu, 1 ha=15 mu.

Table 7.3. Vegetable farmers' market choice, mean and (S.D.).

Variables	Markets				
	Total	Field traders	Wet markets	Wholesale markets	Processing companies
Number of samples (%)	167 (100%)	31 (18.6%)	59 (35.3%)	54 (32.3%)	23 (13.8%)
Market share in year 2004 (%)	100 (0.0)	19.0 (38.4)	36.8 (46.2)	30.4 (44.4)	13.8 (34.5)
Total farmland (ha)	0.2 (0.15)	0.2 (0.11)	<b>0.15</b> (0.10)	0.3 (0.19)	<b>0.24</b> (0.16)
Yield (USD/ha·year)	6,970.6 (4,019.1)	5,002.0 (2,589.2)	<b>8,113.4</b> (4,231.5)	7,908.0 (4,010.2)	<b>4,491.9</b> (3,041.0)
Experience (years)	22.0 (12.6)	17.7 (10.8)	24.1 (14.5)	22.8 (12.1)	20.9 (10.1)
Market distance (km)	5.3 (10.8)	<u>0.7</u> (0.7)	4.3 (6.2)	9.4 (17.08)	<u>4.4</u> (2.5)
Sales frequency (times per week)	6.0 (1.5)	5.7 (1.6)	<b>6.4</b> (1.2)	6.0 (1.7)	<b>5.2</b> (1.5)
Sales time per day (hour)	3.6 (2.1)	<u>1.7</u> (0.8)	<b>5.7</b> (1.5)	2.8 (1.4)	<b>2.2</b> (0.7)

Note: 1. Independent Samples Test is performed to test for equality of means; 2. All channels are compared to processing company chain; 3. 5% statistical level is used as criteria; 4. The variables with significantly different means from processing company chain are marked as underline (for field trader chain), bold (for wet market chain), and italic (for wholesale market chain).

Source: own survey.

from the processing company market chain are marked as underline (for field trader chain), **bold** (for wet market chain) and *italic* (for wholesale market chain).

Of the 167 vegetable farmers we interviewed, more than one-third sold their vegetables directly to consumers at the wet markets (59 cases); another one-third sold to traders at the wholesale markets (54 cases); and the rest of vegetable farmers either sold vegetables to traders at the field (31 cases) or delivered vegetables to processing companies (23 cases)<sup>28</sup>. Market share of each market outlet is nearly the same as the percentage of vegetable farmers in each market outlet. This suggests that the scale of vegetable production is similar among farmers.

<sup>28</sup> The 23 processing companies are the only company-based buyers for producers' vegetables. Thus in the current study, the sellers and the buyers are not exactly the same for the three buyer-seller relationships we discussed. This is also recognised as a limitation of this study which will be discussed in Chapter 8 (see Section 8.5).

As discussed earlier, the scale of vegetable production is rather small in Jiangsu Province (0.2 ha). However, there are significant differences between vegetable farmers who sell vegetables to the wet markets (0.15 ha) and to processing companies (0.24 ha, Table 7.3). There are also significant differences in vegetable yield between vegetable farmers who sell vegetables to the wet markets (8,113 USD/ ha·year) and to processing companies (4,492 USD/ ha·year); and between vegetable farmers who sell vegetables to wholesale market (7,908 USD/ ha·year) and to processing companies. The average market experience of vegetable farmers is about 22 years. There is no significant difference in terms of market experience across market outlets.

The average distance to the market is about 5.3 km. Significant differences are found between vegetable farmers who sell vegetables to field traders (0.7 km) and to processing companies (4.4 km); and between vegetable farmers who sell vegetables to the wholesale markets (9.4 km) and to processing companies. The average sales frequency is about six times per week in the production season. All channels had fairly equal transaction frequency which means that farmers marketed vegetables nearly every day. However, there is significant difference between vegetable farmers who sell vegetables to the wet markets and to processing companies. The average sales time is about 3.6 hours per transaction day. With small volume transactions, farmers spend about 5.7 hours per day at the wet markets. Transactions with traders take only about 1.7 hours at the field, while 2.8 hours at the wholesale markets. The long sales time at the wet markets is also partly due to the long transportation distance and time. Compared to sell vegetables to processing companies, the sales time at the wet markets is significantly longer, while the sales time with field traders is significantly shorter.

Farmers use different transportation means to deliver their vegetables to the market. About three quarters of the farmers use bicycles or tricycles to bring vegetables to the wet markets. About 65% of the farmers use bicycles or tricycles to deliver vegetables to the wholesale markets. In one particular region, Xinghua County, boats are the most commonly used vehicles to deliver vegetables to processing companies. For trade at the field, transportation is provided by the buyers (traders).

The quality standards in different market outlets are listed in Table 7.4. Three quality standards, namely Pollution-Free Food, Green A Food, Green AA Food/Organic Food, are available in China<sup>29</sup>. But these vegetable quality standards are not well implemented by vegetable farmers in the research area. More than 90% of the farmers produce vegetables without a quality standard. Only about 7% of the farmers produce pollution-free vegetables, whereas no green or organic vegetables are produced by farmers.

Seed is one of the important factors that determine the vegetable quality. Table 7.5 provides the information of the sources of seeds and the evaluation of seed quality. More than 20% of the farmers breed seeds by themselves, and they believe that the quality of the seeds is very

<sup>29</sup> Detailed information about the food quality standards are provided in Section 2.3.

*Table 7.4. Quality standards in the market outlets.*

<b>Market outlets</b>	<b>Quality standard</b>		
	<b>No standard (%)</b>	<b>Pollution-Free Food (%)</b>	<b>Total (%)</b>
Wet market	35.3	0.0	35.3
Field trader	18.6	0.6	19.2
Wholesale market	25.7	6.0	31.7
Processing company	13.2	0.6	13.8
Total (%)	92.8%	7.2%	100%

Source: own survey.

*Table 7.5. The source and quality of the seeds.*

	<b>% of the respondents</b>	<b>Seed quality evaluation*</b>
Own breeding	22.8	4.68 (0.47)
Seeds from research institute	5.4	4.11 (0.60)
Seeds from commercial seed company	71.2	3.79 (0.62)
Seeds from buyers	0.6	5 (0.00)
Total	100%	--

\*The quality of the seeds from each source is evaluated by 5-point Likert scale measures, from 1=very bad to 5=very good

Source: own survey.

good. Most of the farmers (71%) buy seeds from commercial seed companies, but they are not very satisfied with the quality of the seeds. In very few cases, farmers acquire high quality seeds from buyers. Farmers do not change seeds very often. About 80% of the farmers responded that they do not change seeds within two years, 20% of them change seeds every year, and only one farmer said that he changes seeds every season (see Table 7.6).

### 7.1.2 Profile of the vegetable buyers

We interviewed different vegetable buyers in Jiangsu Province. The buyer sample consisted of vegetable processing companies (63), trading and exporting companies (16) and supermarkets (5). In total 84 company buyers were interviewed. We study different buyer-seller relationships

Table 7.6. Seeds changing frequency.

Seeds changing frequency	% of the respondents
Change every season	0.6
Change every year	20.4
Change every 2-3 years	41.9
Change after more than 3 years	37.1
Total	100%

Source: own survey.

(upstream and downstream partnerships) for the buyers' vegetable businesses. We also look at the differences in company characteristics in terms of vegetable sourcing and selling channels. Table 7.7 provides the company profiles in relationships with upstream partners (vegetable sourcing). We perform the test to compare means for each pair of sourcing channels.

About three quarters of the vegetable company buyers (72.6%) purchase vegetables directly from small-scale farmers. About 12% of the company buyers use domestic food companies as vegetable suppliers. About 8% of the company buyers purchase vegetable from traders. Some of them (6%) also buy from specialised vegetable production sites (see sample distribution in Table 7.7).

On average, vegetable company buyers has about 7.5 years of business experience in vegetable industry and employs about 166 employees. The oldest company has 50 years of experience, and the biggest company employs about 1,200 workers. The average total sales are about one million USD. About 70% of the company buyers purchase pollution-free vegetables.

Vegetable company buyers show significant differences in different sourcing channels. The company with the most employees likes to purchase vegetables from production sites while the company with the fewest employees prefers to purchase vegetables directly from farmers. In terms of total sales, the largest company prefers to buy vegetables from traders; while the smallest company tends to buy vegetables from individual farmers.

Table 7.8 provides the company profiles in relationships with downstream partners (vegetable selling behaviour). We include the eight vegetable production companies in this table since they also sell vegetables to different market outlets. We perform the test to compare means for each pair of destination channels.

Almost half of the vegetable company buyers (47.8%) sell their vegetables to international markets; more than one-third sell vegetables either to food companies (17.4%) or to consumers

*Table 7.7. Vegetable buyers' profiles in different sourcing channels, mean and (S.D.).*

	All samples	Farmers	Traders	Food companies	Production sites
Years in vegetable business (years)	7.5 (6.61)	7.6 (7.40)	6.7 (2.98)	5.8 (2.74)	9.0 (5.43)
Employees	165.6 (248.75)	<b>123.6</b> (190.7)	209.3 (351.53)	258.9 (364.81)	<b>432.0</b> (336.04)
Total sales*	4.4 (0.93)	<u>4.3</u> (0.97)	<u>4.7</u> (0.48)	4.6 (0.97)	4.6 (0.89)
Pollution-free quality standards application (yes=1)	0.7 (0.46)	0.8 (0.43)	0.4 (0.53)	0.5 (0.53)	0.8 (0.45)
Samples (%)**	84 (100%)	61 (72.6%)	7 (8.3%)	10 (11.9%)	5 (6.0%)

\*1=less than 50,000 USD; 2=50,000-100,000 USD; 3=100,000-500,000 USD; 4=500,000-1,000,000 USD; 5=more than 1,000,000 USD.

\*\*Only one buyer purchased a large portion of vegetables from wholesale markets. So we did not include wholesale markets in this table.

Note: 1. Independent Samples Test is performed to test for equality of means; 2. 5% statistical level is used as criteria.

Source: own survey.

(17.4%) directly at domestic markets; the rest, less than 20% of the company buyers, sell vegetables either to wholesale markets (9.8%) or to supermarkets (see sample distribution in Table 7.8)

The company buyers have about seven years' of experience in vegetable industry and employ about 155 employees. The average total sales are about one million USD. About 67% of the buyers sell pollution-free vegetables.

Vegetable company buyers also show significant differences in different destination markets. The company buyers that sell vegetables to international markets have the longest market experience (9.4 years), while the company buyers that sell vegetables to domestic food companies have the shortest market experience (5.1 years). In terms of total sales, the largest buyers prefer to sell vegetables to international markets; while the smaller buyers tend to sell vegetables to domestic food companies, wholesale markets or to consumers directly.

Table 7.8. Vegetable buyers' profiles in different destination channels, mean and (S.D.).

	All samples	International markets	Food companies	Wholesale markets	Supermarkets	Consumers
Year in vegetable business (years)	7.42 (6.53)	<b>9.43</b> (8.17)	<b>5.13</b> (3.74)	5.33 (2.55)	5.14 (2.61)	6.38 (4.82)
Employees	154.66 (240.26)	180.14 (271.58)	187.13 (319.22)	97.11 (111.45)	106.57 (88.08)	105.56 (135.92)
Total sales*	4.28 (1.02)	<b>4.66</b> (0.68)	<b>3.81</b> (1.11)	4.11 (1.27)	4.57 (0.79)	<u>3.69</u> (1.25)
Pollution-free quality standards application (yes=1)	0.67 (0.47)	0.64 (0.49)	0.69 (0.48)	0.67 (0.50)	0.57 (0.53)	0.81 (0.40)
Samples (%)	92 (100)	44 (47.8)	16 (17.4)	9 (9.8)	7 (7.6)	16 (17.4)

\*1=less than 50,000 USD; 2=50,000-100,000 USD; 3=100,000-500,000 USD; 4=500,000-1,000,000 USD; 5=more than 1,000,000 USD.

Note: 1. Independent Samples Test is performed to test for equality of means; 2. 5% statistical level is used as criteria.

Source: own survey.

Table 7.9 provides the proportion of vegetables in different sourcing and destination outlets of vegetable company buyers for the years 2001 and 2004 and their expectation in 2007. The major sourcing outlet is vegetable farmers. In 2004, 67% of the total vegetables were purchased from this outlet. Only 1% of vegetables were purchased from the wholesale markets (Table 7.9, left side). Comparing the market share for different sourcing channels and different years, we find a clear trend that vegetable company buyers are shifting away from purchasing their vegetables from traders to purchasing their vegetables directly from vegetable producers (individual farmers or specialised production sites)<sup>30</sup>.

When we look at the destination outlets, we also include eight vegetable production companies (see Footnote 26). Most vegetable company buyers sell their vegetables to international markets. The market share of international markets was 45% in 2004, increased about 5% in

<sup>30</sup> We distinguish individual farmers from specialised production sites in this research although they have some links. Some production sites are owned by vegetable companies which are recognised as an integration form. The others are individual producers who are organised by village leaders or contracted to companies. Thus either form of production sites is different in terms of transaction conditions compared to individual farmers.

*Table 7.9. The proportion of vegetables in different sourcing and destination channels of vegetable company buyers and large production companies.*

<b>Sourcing chain</b>	<b>Market share (%)</b>			<b>Destination chain</b>	<b>Market share (%)</b>		
	<b>2001</b>	<b>2004</b>	<b>2007</b>		<b>2001</b>	<b>2004</b>	<b>2007</b>
Farmers	65.6 (44.5)	67.2 (41.7)	68.3 (42.7)	International markets	40.0 (46.7)	44.8 (45.1)	47.2 (45.8)
Traders	12.0 (29.4)	9.3 (23.4)	7.2 (21.4)	Domestic food companies	26.7 (40.8)	19.5 (31.3)	15.6 (28.7)
Domestic food companies	14.1 (32.0)	13.6 (31.6)	13.5 (31.6)	Wholesale markets	10.1 (29.4)	10.2 (27.6)	10.5 (28.1)
Production sites	6.9 (23.8)	8.5 (23.5)	9.6 (25.9)	Supermarkets	6.8 (24.1)	8.3 (25.0)	10.3 (26.9)
Wholesale markets	1.4 (7.6)	1.4 (7.6)	1.4 (7.6)	Consumers	16.4 (36.5)	17.3 (36.4)	16.3 (35.5)
Total	100	100	100	Total	100	100	100

The means are calculated based on the number of companies involved in related channels.

Standard deviations are in the parentheses.

Source: own survey.

the last three years and expected to increase another 2% in the next three years (Table 7.9, right side). The second important destination outlet is the domestic food companies. In 2004, about 20% of vegetables were sold to domestic food companies. The third important destination outlet is the consumers. About 17% of vegetables were sold directly to consumers in 2004.

Comparing market share for different destination channel and different years, we find a clear trend that vegetable company buyers are moving away from selling their vegetables to food companies to selling their vegetables to international markets and supermarkets. This might be a response to the buyers' modernisation and internationalisation strategies (the high profit margin in international markets and supermarkets) and the reform of trade policies (only with respect to international markets). More and more companies possess import and export rights. With these rights, they are able to export vegetables to international markets directly and do not have to go through specialised exporting companies.

## 7.2 Reliability and validity of formative constructs

As discussed in Section 5.4, both formative constructs (*guanxi* networks, compliance with delivery requirements and contractual governance) and reflective constructs (transaction specific investments, interpersonal trust, compliance quality requirements, and performance indicators) are used in this study. We first discuss the formative constructs in this section. As described in Section 5.4.1, the validation of formative constructs includes content validity, nomological validity, convergent validity, and item multicollinearity. These validation procedures are based on one of the distinguishing properties of formative constructs: namely, omitting an indicator is omitting part of the construct (Bollen and Lennox, 1991).

The *content validity* of the formative constructs is based on previous research (see literature review in Chapter 3 and 4). Many studies review the conceptual meaning of *guanxi* networks as social capital (Lin, 2001; Batjargal and Liu, 2004). The content validity of the construct of *guanxi* networks is further confirmed by the case study. The items consist of resource access, market access and technical, managerial and financial assistances. Empirical study on *guanxi* has produced significant effects on other constructs (variables in the model). Previous study indicated that *guanxi* networks promote interpersonal trust (Farh *et al.*, 1998), encourage trust-based exchanges (Hill, 1995), moderate (versus direct) investment selection (Batjargal and Liu, 2004), and enhance firm performance (Peng and Luo, 2000).

In terms of the other two formative constructs, namely the compliance with delivery requirements and contractual governance, several studies discovered that the choice of marketing channel and governance is closely related to the transaction environment (Burns and Stalker, 1961; Donaldson, 1995), product characteristics (perishable specific, Lu, 2003), channel strategy (Bradach and Eccles, 1989; Rindfleisch and Heide, 1997; Brousseau, 2000; Brassington and Prttitt, 2003; Mizumoto and Zylbersztajn, 2004), and governance strategy (Menard, 1996; Hueth *et al.*, 1999). Thus the compliance with the delivery requirements and contractual governance are largely influenced by channel and governance characteristics. In a trusting buyer-seller relationship with a high level of transaction specific investments, the sellers are more able and willing to comply with buyers' requirements regarding the delivery conditions.

The *nomological validity* of the formative constructs is confirmed by estimating the structural equations in our theoretical models. The following Sections 7.4 to 7.6 provide the estimated models for the farmer and buyer samples. A substantial number of significant relationships are found between the formative constructs and the other constructs in the model. So, we are confident that the nomological validity of the formative constructs is confirmed.

The *convergent validity* measures the extent to which the scale correlates positively with other measures of the same construct (Churchill, 1979). We checked the item-total correlations with the respective composite score (unweighted average of items). The coefficients are greater

than 0.5 and significant in both the farmer and buyer samples. This confirms the convergent validity of the formative indicator constructs.

Multicollinearity of the set of items that compose each formative construct is also checked by examining the size of the correlation coefficient for each construct (Diamantopoulos and Winklhofer, 2001). The coefficients do not suggest any obvious problem of item multicollinearity that would preclude their use. The coefficients that lie below the threshold value of 0.80 are considered to show no problems of multicollinearity (Malhotra *et al.*, 1999). All the correlations are below 0.80.

### **7.3 Reliability and validity of reflective constructs**

To perform the convergent validity, reliability, discriminant validity test, we measure each reflective construct in a measurement model for the farmer sample and the buyer sample separately. We performed measurement models for each buyer-seller relationship (farmers in relationships with vegetable buyers; buyers in relationships with vegetable suppliers; and buyers in relationships with their final customers). The results of the measurement models are reported in the following subsections.

#### **7.3.1 Convergent validity**

The *convergent validity* of the constructs is based on the item-total correlation and factor loadings (Table 7.10). The majority of the item-total correlations<sup>31</sup> are above the threshold of 0.6, and the factor loadings are greater than 0.7 for all samples. This confirms the convergent validity of the reflective constructs.

#### **7.3.2 Reliability**

The *reliability* of each construct reflects its internal consistency and is assessed with Cronbach alpha, composite reliability and average variance extracted (AVE, see Table 7.11). All these measures are obtained from the measurement model in PLS. For all reflective constructs, the AVE is close to and greater than 0.60, and the composite reliability is well greater than 0.70. Only the Cronbach alpha of the construct compliance with quality requirements for the buyer sample is lower than the threshold of 0.70. As mentioned earlier, this construct only include two items, so the low value of Cronbach alpha is reasonable. Werts *et al.* (1974) argued that the composite reliability measure is superior to Cronbach alpha since it uses the item loadings obtained within the nomological network (or cause model). In other words, in comparison with Cronbach alpha, composite reliability does not assume the equivalency among the measures with its assumption that all indicators are equally weighted (Chin, 1998). Therefore with a high level of composite reliability, we believe our reflective constructs are reliable.

<sup>31</sup> Item-total correlation shows the correlation of one item of the construct with the sum of all of the other items of the construct. The threshold value for the item-total correlation is 0.6 (Steenkamp and van Trijp, 1991).

Table 7.10. Analysis of reflective constructs for the farmer and the buyer sample.

Constructs	Indicator	Farmer sample		Buyer sample (upstream partners)		Buyer sample (downstream partners)	
		Item-total correlation	Factor loading	Item-total correlation*	Factor loading*	Item-total correlation	Factor loading
Transaction specific investments	TSI1	0.845	0.912	0.466	0.688	0.634	0.816
	TSI2	0.843	0.913	0.688	0.855	0.634	0.808
	TSI3	0.814	0.891	0.729	0.862	0.852	0.922
	TSI4	0.770	0.843	0.576	0.737	0.596	0.750
	TSI5	0.715	0.808	n.a.	n.a.	n.a.	n.a.
Interpersonal trust	trust1	0.609	0.715	0.705	0.786	0.635	0.691
	trust2	0.636	0.731	0.697	0.786	0.522	0.645
	trust3	0.634	0.730	0.634	0.719	0.636	0.733
	trust4	0.662	0.763	0.583	0.698	0.593	0.717
	trust5	0.637	0.753	0.621	0.735	0.553	0.685
	trust7	0.693	0.791	0.632	0.748	0.612	0.761
	trust8	0.756	0.845	0.751	0.844	0.636	0.758
	chqual1	0.307	0.532	0.325	0.640	0.472	0.858
Quality requirements	chquali2	0.758	0.940	0.485	0.800	0.472	0.858
	chquali3	0.790	0.946	0.507	0.812	n.a.	n.a.
	pqual1	0.400	0.705	0.561	0.883	0.547	0.879
Quality/price satisfaction**	pqual2	0.633	0.880	0.561	0.883	0.547	0.879
	pqual3	0.424	0.719	n.a.	n.a.	n.a.	n.a.
	effi1	0.674	0.846	0.778	0.943	0.741	0.933
Efficiency	effi2	0.771	0.902	0.778	0.943	0.741	0.933
	effi3	0.776	0.905	n.a.	n.a.	n.a.	n.a.

\*For the constructs with two items, the factor loading and item-total correlation for each item are the same.

\*\*The name of the construct is based on the actual questions that are included in the construct. For buyers in relationships with upstream partners, only price-related questions are used, therefore, we use 'price satisfaction' as the construct name in this case.

Table 7.11. Reliability of the reflective constructs for the farmer and the buyer sample.

Constructs	Farmer sample			Buyer sample (upstream partners)			Buyer sample (downstream partners)		
	Cronbach $\alpha$	AVE	Composite reliability	Cronbach $\alpha$	AVE	Composite reliability	Cronbach $\alpha$	AVE	Composite reliability
Transaction specific investments	0.921	0.764	0.942	0.790	0.620	0.867	0.838	0.675	0.892
Interpersonal trust	0.872	0.581	0.906	0.869	0.578	0.905	0.823	0.523	0.884
Quality requirements compliance	0.762	0.572	0.800	0.617	0.546	0.782	0.641	0.703	0.822
Quality/price satisfaction	0.660	0.592	0.812	0.709	0.603	0.752	0.702	0.771	0.871
Efficiency	0.861	0.782	0.915	0.874	0.866	0.928	0.851	0.845	0.915

### 7.3.3 Discriminant validity

The measurement for *discriminant validity* is done in two ways. First, we compare the square root of the average variances extracted (AVE) to the construct correlations. For discriminant validity, the square root of AVE should be greater than all correlations of the constructs. In this study, all the values in the diagonal (square root of AVE) are greater than all correlations of the constructs (see Appendix D, Part I). Second, the test involves assessing how each item relates to the latent construct. All items should load more highly to its associated construct than to other constructs (Fornell and Larcker, 1981), as is the case here for all three buyer-seller relationships (see Appendix D, Part II). Both these criteria indicate that the discriminant validity of the constructs used in this study is adequate. So we can confidently rely on the path coefficients to interpret the relationships among constructs.

### 7.3.4 Nomological validity

As discussed earlier, *nomological (or criterion) validity* for reflective constructs assessment need to examine the other constructs that affect the focal construct (Bollen and Lennox, 1991). The

nomological validity is assessed with empirical data. In this study, we checked the nomological validity when testing our propositions about the relations between the reflective constructs and other constructs. The significance of construct coefficients in the model demonstrates the validity of the measures.

## 7.4 Model of *guanxi* networks and buyer-seller relationships

As discussed earlier, we apply Partial Least Squares (PLS) to test our conceptual research model. Since we want to investigate both direct and indirect impacts of exogenous variables on endogenous variables, we linked all proposed relationships in the research model (see Figure 7.1).

We identified the items that compose each construct by assessing the validity and reliability of each formative and reflective construct (see section 7.2 and 7.3). These constructs reflect the concepts of our conceptual research model and form the basis of our analysis. We use PLS to describe our conceptual framework by exploring the paths with survey data. The model will be modified if there is any necessity (such as the removal of a construct with very low  $R^2$ ). PLS estimates the structural and measurement model in a one-step procedure. The structural model part is represented by the latent variables within the circles. The arrows represent the proposed path relationships. This model will be applied for both the farmer and the buyer sample.

Compliance with buyer's delivery requirements and quality requirements, efficiency, quality/price satisfaction, and profitability are identified as the indicators to measure performance. In order to discover the effects of *guanxi* networks on buyer-seller relationships (transaction specific investments, interpersonal trust and contractual governance), we estimate the models for the farmer sample ( $n=167$ ) and the buyer sample ( $n=84$  for upstream partners and  $n=92$  for downstream partners) separately. We discuss the results in detail in the following sections.

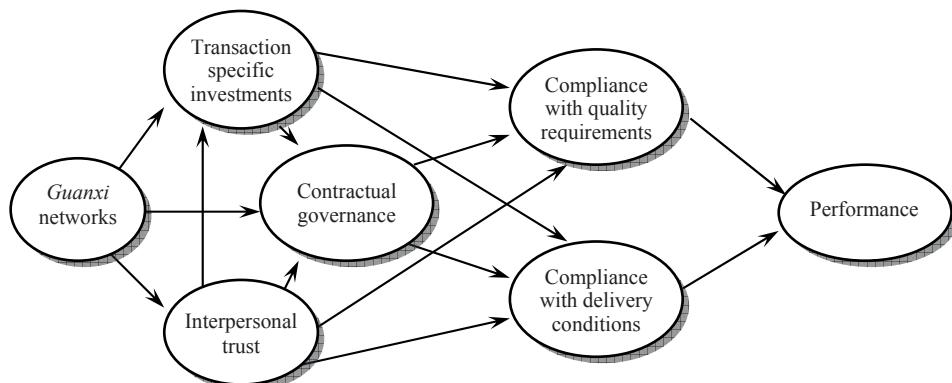


Figure 7.1. Structural model.

## 7.5 Buyer-seller relationships in the farmer sample

### 7.5.1 Baseline description

We first investigate the statistical descriptions for each variable (construct). The unweighted score of each construct (reflective and formative) is calculated with related manifest variables. The means, standard deviations and the correlations among variables are calculated and shown in Table 7.12.

Recall that all observed variables in this study are measured by 5-Likert scales from 1 (not agree at all) to 5 (totally agree), so a value of the mean above 3 indicates that the respondents agree with the statements. Table 7.12 shows that most of the constructs in this study have a positive response (agree with the statements). Only the construct of compliance with quality requirements shows somewhat negative answer (means are smaller than 3). The low mean implies that the vegetable quality standards (such as Green Food, Organic Food) are not implemented by vegetable farmers. This coheres with the results in Table 7.4.

Table 7.12. Construct means, standard deviations and correlation matrix for the farmer sample.

	Mean	S.D.	1	2	3	4	5	6	7	8
1. Guanxi networks	3.55	0.60								
2. TSI	4.11	0.70	<b>0.47</b>							
3. Interpersonal trust	4.06	0.54	<b>0.46</b>	<b>0.53</b>						
4. Contractual governance	3.82	0.72	<b>0.19</b>	<b>0.44</b>	<b>0.50</b>					
5. Compliance with quality requirements	2.45	0.64	<b>0.39</b>	<b>0.22</b>	<b>0.17</b>	0.03				
6. Compliance with delivery requirements	4.29	0.50	<b>0.36</b>	<b>0.46</b>	<b>0.52</b>	<b>0.49</b>	<b>0.24</b>			
7. Efficiency	4.23	0.76	<b>0.26</b>	<b>0.28</b>	<b>0.59</b>	<b>0.32</b>	0.07	<b>0.29</b>		
8. Quality/price satisfaction	4.33	0.55	<b>0.44</b>	<b>0.55</b>	<b>0.49</b>	<b>0.41</b>	<b>0.21</b>	<b>0.50</b>	<b>0.18</b>	
9. Profitability	4.44*	0.65	0.14	<b>0.44</b>	<b>0.21</b>	<b>0.29</b>	0.02	<b>0.19</b>	0.12	<b>0.45</b>

\*profitability is measured with 7-point Likert scale.

Note: In this correlation matrix, correlations (**bold**) with a value of at least 0.18 are significant at 5% level.

The correlation matrix in Table 7.12 shows that *guanxi* networks are significantly associated with buyer-seller relationships (transaction specific investments, interpersonal trust and contractual governance which are labelled with numbers 2, 3 and 4 in Table 7.12) and market performance (compliance with quality and delivery requirements, efficiency and quality/price satisfaction which are labelled with numbers 5, 6, 7, and 8 in Table 7.12). This finding indicates that the support obtained from vegetable farmers' *guanxi* networks significantly contribute to the integration of buyer-seller relationships and market performance.

We also checked the possible multicollinearity for our constructs. Researchers commonly use a cut-off of 0.80 for correlations among variables for dismissing multicollinearity problems (Hair *et al.*, 1998; Malhotra *et al.*, 1999). With all the correlation coefficients well below 0.8 (the highest correlation is 0.59 in Table 7.12), the individual magnitude of the correlations between the constructs for the farmer sample does not suggest obvious problems of pairwise collinearity. So we can use all listed constructs in one model.

### 7.5.2 Model results for the farmer sample

Table 7.13 provides the results of the path analysis for the vegetable farmer sample<sup>32</sup>. The focal buyer-seller relationships are depicted from the sellers' (farmers') point of view in the left part of Figure 7.2. The estimated model is based on the structural model (see Figure 7.1). Based on the validity and reliability tests, the constructs used in this PLS model are reliable to interpret the relationships among constructs. In order to obtain the significant level of the path coefficients, we run bootstrapping with 500 times resampling as suggested by Chin (1998).

As we can see from Table 7.13, 11 out of 18 (61%) path coefficients are significant at 1% or 5%. The overall model explains about 22.1% of the variance of the endogenous latent variables. Both criteria indicate that a satisfactory model fit is obtained for the vegetable farmer sample.

<sup>32</sup> We performed an additional analysis that only included the farmers who sell vegetables to processing companies (23 cases). In doing this, we try to compare with buyers in relationships with upstream partners. Unfortunately, the model with 23 cases (18 estimated paths) was not able to reach converge.

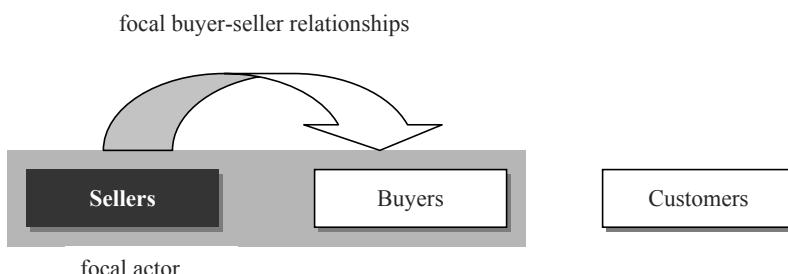


Figure 7.2. Focal buyer-seller relationships for vegetable sellers.

*Table 7.13. Path model parameter estimates for the farmer sample (n=167).*

<b>Relationships</b>	<b>PLS estimation <sup>a</sup></b>	<b>Standard error</b>	<b>t statistics</b>	<b>Sig. level <sup>b</sup></b>
Guanxi networks → Transaction specific investments	0.29	0.07	4.29	***
Guanxi networks → Interpersonal trust	0.46	0.06	7.73	***
Guanxi networks → Contractual governance	0.03	0.07	0.45	
Transaction specific investments → Compliance with quality requirements	0.29	0.09	3.41	***
Transaction specific investments → Compliance with delivery requirements	0.12	0.07	1.73	
Transaction specific investments → Contractual governance	0.16	0.09	1.70	
Interpersonal trust → Transaction specific investments	0.40	0.08	5.16	***
Interpersonal trust → Compliance with quality requirements	0.08	0.07	1.12	
Interpersonal trust → Compliance with delivery requirements	0.27	0.08	3.64	***
Interpersonal trust → Contractual governance	0.24	0.08	2.84	***
Contractual governance → Compliance with quality requirements	0.12	0.08	1.45	
Contractual governance → Compliance with delivery requirements	0.37	0.09	4.31	***
Compliance with quality requirements → Efficiency	0.01	0.06	0.23	
Compliance with quality requirements → Quality/price satisfaction	0.22	0.06	3.47	***
Compliance with quality requirements → Profitability	0.04	0.05	0.71	
Compliance with delivery requirements → Efficiency	0.27	0.11	2.65	***
Compliance with delivery requirements → Quality/price satisfaction	0.38	0.07	5.49	***
Compliance with delivery requirements → Profitability	0.19	0.08	2.30	**

<sup>a</sup> Sign and path coefficients of the proposed relationships (direct effect)

<sup>b</sup> \*\*\*: p<0.01; \*\*: p<0.05.

Note: Average  $R^2 = 0.221$

The results indicate a significant impact of the support obtained from the farmers' *guanxi* networks on buyer-seller relationships. *Guanxi* networks improve the willingness to engage in interpersonal trust for the farmers in relationships with vegetable buyers ( $\gamma=0.46$ ). *Guanxi* networks also increase the farmers' willingness to invest in specific transactional assets ( $\gamma=0.29$ ) to facilitate vegetable transactions and marketing activities. Based on the magnitude of the path coefficients, we conclude that the effects of *guanxi* networks on interpersonal trust are higher than that on TSI. *Guanxi* networks do not have a significant effect on contractual governance. This is because contracts are seldom used by small-scale farmers for vegetable transactions as we have pointed out in Chapter 4.

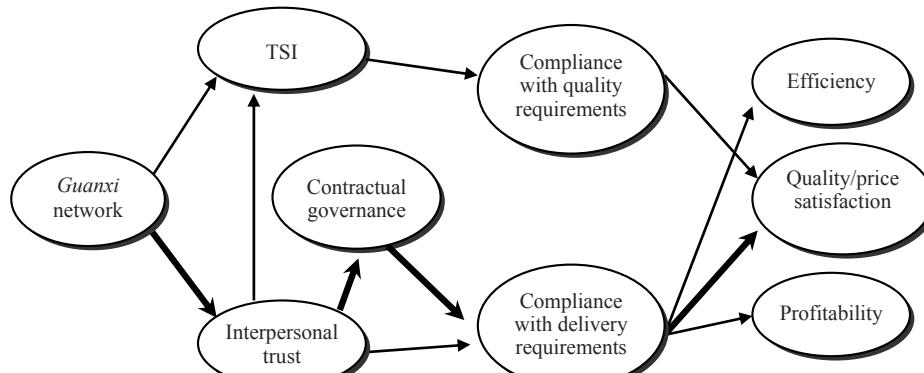
As expected, interpersonal trust has a significant effect on TSI for vegetable farmers ( $\beta=0.40$ ). This implies that vegetable farmers are more willing to invest in specific transactional assets if trust in buyer-seller relationships exists.

TSI significantly affect the compliance with buyers' quality requirements ( $\beta=0.29$ ). This implies that vegetable farmers can achieve a high level of quality compliance with a high level of TSI. Interpersonal trust shows a significant direct impact on the compliance with buyers' delivery requirements ( $\beta=0.247$ ) and contractual governance ( $\beta=0.43$ ). This demonstrates that in a trusting buyer-seller relationship, vegetable farmers are more willing to comply with the buyer's delivery requirements and conduct transactions using formal contracts. A significant relation between contractual governance and the compliance with delivery requirements is revealed ( $\beta=0.37$ ). This implies that vegetable farmers are more able to comply with buyers' requirements regarding delivery conditions in case the transactions are conducted based on formal contracts.

Table 7.13 also shows the positive effects of the compliance with quality and delivery requirements on chain performance. Complying with the buyers' quality requirements has a significant and positive effect on quality/price satisfaction ( $\beta=0.22$ ), while complying with the buyers' delivery requirements has a significant and positive effects on efficiency ( $\beta=0.27$ ), quality/price satisfaction ( $\beta=0.38$ ) and profitability ( $\beta=0.19$ ). Therefore, if the farmers are able to comply with the buyers' quality requirements, they can achieve higher quality/price satisfaction. But if farmers are able to comply with the buyers' delivery conditions, they can conduct transactions more efficiently, obtain higher quality/price satisfaction, and achieve a higher level of profitability.

### 7.5.3 Performance paths for the farmer sample

Connecting all significant paths among *guanxi* networks, buyer-seller relationships and performance, we can graphically interpret the model results (Figure 7.3). The thick arrows in Figure 7.3 indicate the most important significant paths. Following the thick arrows and looking back from performance indicators, we are able to identify the most important routes for the vegetable farmers to achieve good performance. As indicated in Figure 7.3, quality/



→ The arrows show the significant path coefficients  
 → The thick arrows indicate the highest path coefficients

Figure 7.3. The significant relationships for the farmer sample.

price satisfaction is the most important performance attributes for vegetable farmers. A higher level of quality/price satisfaction can be realised through a better compliance with the buyers' delivery requirements, the better compliance with the buyers' delivery requirements can be achieved by using contractual governance, and the use of contractual governance can be promoted by a higher level of interpersonal trust. Finally, the higher level of interpersonal trust can be realised by the support obtained from *guanxi* networks.

## 7.6 Buyer-seller relationships with upstream partners in the buyer sample

### 7.6.1 Baseline description

The means, standard deviations and correlations among variables for vegetable buyers with upstream partners are calculated and shown in Table 7.14. The mean of *guanxi* networks for vegetable buyers with upstream partners is slightly higher than that for vegetable farmers (3.84 vs. 3.55). This implies that the buyers' *guanxi* networks are better developed. The means of TSI and interpersonal trust for the buyer sample with upstream partners are lower than that for the farmer sample. This means that the vegetable buyers have lower interpersonal trust on their vegetable suppliers and invest less in specific transactional assets for vegetable procurement (3.91 vs. 4.11 for TSI and 3.89 vs. 4.06 for interpersonal trust). The mean of compliance with quality requirements for vegetable buyers with upstream partners is well below the middle point, which implies that vegetable suppliers did not apply high quality standards in vegetable production. This is consistent with the result for the farmer sample. Table 7.14 also indicates that the mean of profitability for vegetable buyers with upstream partners is higher than that

Table 7.14. Construct means, standard deviations and correlation matrix for the buyer sample with upstream partners.

	Mean	SD	1	2	3	4	5	6	7	8
1. Guanxi networks	3.84	0.78								
2. TSI	3.91	0.71		<b>0.20</b>						
3. Interpersonal trust	3.89	0.55		<b>0.20</b>	<b>0.21</b>					
4. Contractual governance	3.87	0.74		0.11	0.04	<b>0.55</b>				
5. Compliance with quality requirements	1.28	0.74		<b>0.27</b>	<b>-0.27</b>	<b>0.29</b>	<b>0.21</b>			
6. Compliance with delivery requirements	3.95	0.60		<b>0.19</b>	0.05	<b>0.65</b>	<b>0.45</b>	<b>0.39</b>		
7. Efficiency	4.17	0.76		<b>0.20</b>	0.16	<b>0.19</b>	<b>0.23</b>	0.13	<b>0.25</b>	
8. Price satisfaction	4.12	0.52		-0.06	0.03	<b>0.40</b>	<b>0.20</b>	-0.02	0.09	0.10
9. Profitability	5.42*	1.23		0.09	<b>0.33</b>	0.11	0.03	0.00	<b>0.24</b>	<b>0.22</b>
										0.13

\*profitability is measured with 7-point Likert scale.

Note: In this correlation matrix, correlations (bold) with a value of at least 0.18 are significant at 5% level.

for vegetable farmers (5.42 vs. 4.44), indicating that the vegetable buyers perceive a higher level of profitability compared to the vegetable farmers.

Regarding the bivariate correlations, *guanxi* networks are significantly associated with buyer-seller relationships (TSI and interpersonal trust) and market performance (compliance with quality and delivery requirements and efficiency). This is consistent with what we found for the farmer sample that the support obtained from vegetable buyers' *guanxi* networks significantly contribute to the integration of buyer-seller relationships and market performance.

The highest correlation for the buyer sample is 0.65 which dismisses the multicollinearity problems (Malhotra *et al.*, 1999).

## 7.6.2 Model results for the buyer sample with upstream partners

Table 7.15 provides the results of the path analysis for the buyer sample with upstream partners<sup>33</sup>. The estimated model is based on the structural model shown in Figure 7.1. The focal buyer-seller relationships are depicted in Figure 7.4. As indicated in Table 7.15, 7 out of 18 (39%) paths are significant at 5% or 1%. The overall model explains about 20.3% of the variance of the endogenous latent variables.

Different from vegetable farmers, the support obtained from the buyers' *guanxi* networks has only weak impacts on buyer-seller relationships. This finding confirms the results of Claro (2004) that the buyers do not rely on their personal networks to purchase their vegetables. The sellers and buyers are in different positions in the supply chains. They behave differently regarding the use of *guanxi* networks. This finding also fits the Chinese situation of a buyer dominated vegetable market. In a buyer dominated market, there is no problem for the buyers to purchase sufficient vegetables.

Vegetable transactions are recurrent, and the buyers have to make certain transaction specific investments. Transaction specific investments have a significant negative impact on contractual governance ( $\beta=-0.27$ ), indicating that relational governance is preferred if high level of specific transactional assets are present. This is consistent with the discussion of relational governance in Section 3.3.1.

Interpersonal trust positively affects the compliance with the buyers' quality ( $\beta=0.50$ ) and delivery ( $\beta=0.57$ ) requirements. Interpersonal trust is also positively associated with contractual governance ( $\beta=0.54$ ). In a trusting buyer-seller relationship, vegetable suppliers are more likely to conduct transactions based on contracts and comply with the buyers'

<sup>33</sup> During the factor analysis, the construct of quality/price satisfaction only contains the questions related to price satisfaction. Thus we perform a separate analysis and add an individual construct of quality satisfaction (single item construct). The results showed that all path coefficients related to the quality satisfaction construct are not significant, while the other path coefficients keep the same. Also, the quality satisfaction construct has a very low  $R^2$  (0.02). Thus this construct was removed from the model.

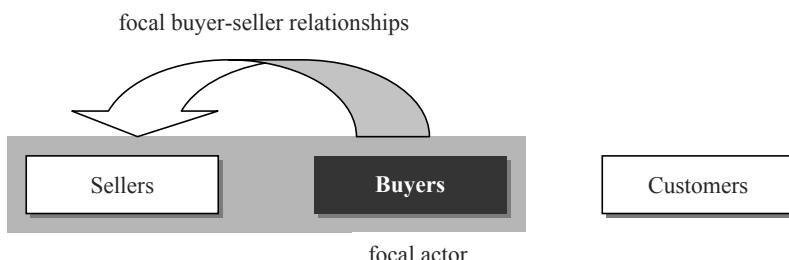


Figure 7.4. Focal buyer-seller relationships for the buyer sample with upstream partners.

Table 7.15. Path model estimates for the buyer sample with upstream partners (n=84).

Relationships	PLS estimation <sup>a</sup>	Standard error	t statistics	Sig. level <sup>b</sup>
Guanxi networks → Transaction specific investments	0.15	0.12	1.25	
Guanxi networks → Interpersonal trust	0.21	0.11	1.93	
Guanxi networks → Contractual governance	0.08	0.09	0.80	
Transaction specific investments → Compliance with quality requirements	-0.19	0.14	-1.40	
Transaction specific investments → Compliance with delivery requirements	-0.03	0.06	-0.40	
Transaction specific investments → Contractual governance	-0.27	0.11	-2.37	**
Interpersonal trust → Transaction specific investments	0.20	0.14	1.51	
Interpersonal trust → Compliance with quality requirements	0.50	0.10	4.99	***
Interpersonal trust → Compliance with delivery requirements	0.57	0.11	5.04	***
Interpersonal trust → Contractual governance	0.54	0.09	6.32	***
Contractual governance → Compliance with quality requirements	0.20	0.10	2.09	**
Contractual governance → Compliance with delivery requirements	0.21	0.11	1.95	**
Compliance with quality requirements → Efficiency	-0.03	0.19	-0.14	
Compliance with quality requirements → Price satisfaction	-0.57	0.32	-1.77	
Compliance with quality requirements → Profitability	-0.16	0.16	-0.96	
Compliance with delivery requirements → Efficiency	0.33	0.21	1.56	
Compliance with delivery requirements → Price satisfaction	0.67	0.32	2.06	**
Compliance with delivery requirements → Profitability	0.36	0.20	1.86	

<sup>a</sup> Sign and path coefficients of the hypothesised relationships (direct effect)

<sup>b</sup> \*\*\*: p<0.01; \*\*: p<0.05.

Note: Average  $R^2 = 0.203$

requirements regarding quality standards and delivery conditions. Although it is positive as expected, the effect of interpersonal trust on TSI is not significant. This finding implies that interpersonal trust is not likely to affect the buyers' investment in vegetable purchasing.

A positive relationship is found between contractual governance and the compliance with quality requirements ( $\beta=0.20$ ) and delivery conditions ( $\beta=0.21$ ). This implies that vegetable suppliers are more willing to comply with the buyers' quality and delivery requirements in case vegetable transactions are conducted based on formal contract.

The compliance with delivery requirements has a positive effect on and the buyers' price satisfaction ( $\beta=0.67$ ). This implies that if vegetable suppliers are able to comply with the buyers' delivery requirements, the buyers can reach a higher level of market performance. Besides quality, price is the major concern for the buyers in vegetable purchasing. The compliance with the buyers' quality requirements does not show a significant impact on market performance. However, a very high negative path coefficient ( $\beta=-0.57$ , significant at 10% level) is found between the compliance with quality requirements and price satisfaction. This is due to the suppressor effects (Krus and Wilkinson, 1986; Maassen and Bakker, 2001)<sup>34</sup>.

Figure 7.5 depicts all significant paths among *guanxi* networks, buyer-seller relationships and performance for vegetable buyers in relationships with upstream partners. The thick arrows in Figure 7.5 indicate the most important significant paths. Following the thick arrows and looking back from performance indicators, we are able to identify the most important routes for the vegetable buyers to achieve good performance. As indicated in Figure 7.5, price satisfaction is the most important performance attributes for vegetable buyers. A higher level of price satisfaction can be realised through a better compliance with the buyers' delivery requirements, and the better compliance with the buyers' delivery requirements can be achieved by a higher level of interpersonal trust. Similar to the vegetable farmer sample, the compliance with delivery requirements is very important to achieve a higher level of market performance.

<sup>34</sup> Suppressor effects are the consequences of the presence of a suppressor variable in the equation. Suppressor variable is a variable that increases the predictive validity of another variable (or set of variables) by its inclusion in a regression equation. This variable is a suppressor only for those variables weights are increased. Three kinds of suppressor variables (classical, net and cooperative) are defined. '*If an independent variable in question has a zero (in practice very small) correlation with the dependent variable, the situation is one of classical suppression. If the beta weight is of opposite sign from its correlation with the dependent variable, it is serving as a net suppressor. If its beta weight exceeds its correlations with the dependent variable and is of the same sign, cooperative suppression is indicated*' (Cohen and Cohen, 1975). For a detail discussion for suppressor variables, see Krus and Wilkinson (1986) and Maassen and Bakker (2001). In our model, the path coefficient between compliance with quality requirements and price satisfaction ( $\beta=-0.57$ ) is much higher (in absolute value) than the bivariate correlation (-0.02). Based on Cohen's definition, this is a negative cooperative suppression. The inclusion of the variable of compliance with quality requirements in the model also increases the path coefficients for the variable of compliance with delivery requirements with performance indicators. To further identify suppression effects, we perform an extra model excluding the variable of compliance with quality requirements. Results showed that path coefficients for the variable of compliance with delivery requirements are decreased. This confirms the suppressor variable of compliance with quality requirements.

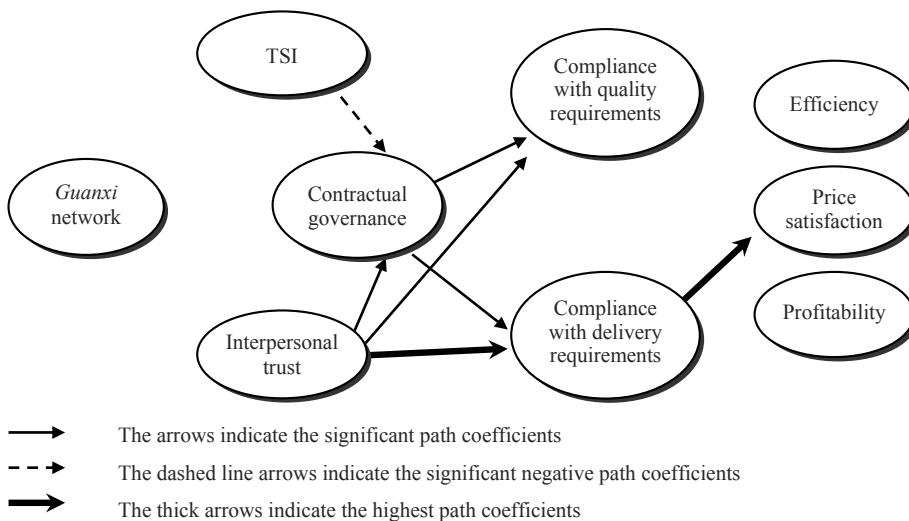


Figure 7.5. The significant relationships for the buyer sample with upstream partners.

## 7.7 Buyer-seller relationships with downstream partners in the buyer sample

### 7.7.1 Baseline description

The means, standard deviations and the correlations among variables for vegetable buyers with downstream partners are calculated and shown in Table 7.16. The mean of *guanxi* networks for vegetable buyers with downstream partners is slightly higher than that for vegetable farmers (3.70 vs. 3.55), but slightly lower than that for vegetable buyers with upstream partners (3.70 vs. 3.84). This indicates that the buyer's *guanxi* networks are better developed, and are more developed in relationships with upstream partners than in relationships with downstream partners. However, the mean of interpersonal trust for vegetable buyers with downstream partners is the highest among three buyer-seller relationships (4.35 vs. 3.89 and 4.06). This implies that the vegetable buyers exhibit a high level of interpersonal trust in relationships with their customers. Transaction specific investments are highest for vegetable buyers in relationships with downstream partners (4.46 vs. 3.91 and 4.11). The mean of the compliance with quality requirements for vegetable buyers with downstream partners is also below the middle point (1.34), implies that the Green Food and Organic Food quality standards are not widely required by the customers. The mean of contractual governance is 4.31, indicating that contractual governance is mostly used for vegetable buyers in relationships with downstream partners. The means of efficiency and quality/price satisfaction are also the highest among the three buyer-seller relationships, indicating that vegetable buyers achieved the highest level of efficiency and quality/price satisfaction in relationships with downstream partners.

Table 7.16. Construct means, standard deviations and correlation matrix for the buyer sample with downstream partners.

	Mean	SD	1	2	3	4	5	6	7	8
1. Guanxi networks	3.70									
	0.96									
2. TSI	4.46	0.68	-0.14							
3. Interpersonal trust	4.35	0.46	<b>0.33</b>	0.13						
4. Contractual governance	4.31	0.87	<b>0.36</b>	-0.16	<b>0.61</b>					
5. Compliance with quality requirements	1.34	0.70	0.11	<b>-0.18</b>	0.15	0.05				
6. Compliance with delivery requirements	4.45	0.51	<b>0.30</b>	0.06	<b>0.65</b>	<b>0.74</b>	0.14			
7. Efficiency	4.38	0.68	0.02	0.13	0.12	0.07	-0.08	0.04		
8. Quality/price satisfaction	4.51	0.48	0.15	<b>0.22</b>	<b>0.49</b>	<b>0.45</b>	0.03	<b>0.62</b>	0.03	
9. Profitability	5.40*	1.24	0.14	0.13	<b>0.22</b>	<b>0.18</b>	<b>-0.21</b>	<b>0.18</b>	-0.08	<b>0.18</b>

\*profitability is measured with 7-point Likert scale.

Note: In this correlation matrix, correlations (bold) with a value of at least 0.18 are significant at 5% level.

In terms of the bivariate correlations, *guanxi* networks are significantly associated with buyer-seller relationships (interpersonal trust and contractual governance) and market performance (compliance with delivery requirements). TSI are negatively related with the compliance with quality requirements, but positively related with quality/price satisfaction. Interpersonal trust is positively related with contractual governance, the compliance with delivery requirements and market performance (quality/price satisfaction and profitability). Correlations also show that the compliance with delivery requirements is negatively related with profitability, while the compliance with quality requirements is positively related to quality/price satisfaction and profitability.

The highest correlation (0.74) is found between contractual governance and the compliance with delivery requirements. Therefore we dismiss the possible multicollinearity problems.

## 7.7.2 Model results for the buyer sample with downstream partners

Table 7.17 shows the results of the path analysis for the buyer sample with downstream partners. The estimated model is based on the structural model shown in Figure 7.1. The focal buyer-seller relationships are depicted in Figure 7.6. One of the performance indicators, efficiency, is omitted from the model due to the very low  $R^2$  (0.01). As indicated in Table 7.17, 9 out 16 (56%) paths are significant at 5% or 1%. The overall model explains about 27.2% of the variance of the endogenous latent variables, indicating good prediction accuracy.

The results indicate that *guanxi* networks have a positive effect on buyer-seller relationships. The support obtained from the buyers' *guanxi* networks improves interpersonal trust ( $\gamma=0.28$ ), increases transaction specific investments ( $\gamma=0.33$ ) and encourages contract-based transactions ( $\gamma=0.25$ ). This implies that with the support from their *guanxi* networks, vegetable processing and exporting companies, supermarket and production companies are more willing to build interpersonal trust, invest in specific transactional assets and conduct transactions based on formal contracts.

Interpersonal trust positively affects the compliance with delivery requirements ( $\beta=0.30$ ). This reveals that in a trusting buyer-seller relationship, vegetable processing and exporting companies, supermarkets and production companies are more willing to comply with their customers' delivery requirements.

TSI ( $\beta=0.17$ ) and interpersonal trust ( $\beta=0.58$ ) are positively associated with contractual governance. This indicates that when TSI is high and/or the vegetable buyers trust their customers, they are more likely to use formal contracts to conduct transactions. Furthermore, when formal contracts exist, the buyers are more willing to comply with delivery requirements ( $\beta=0.56$ ).

As expected, the compliance with delivery requirements positively affects quality/price satisfaction ( $\beta=0.65$ ) and profitability ( $\beta=0.23$ ). This indicates that if vegetable buyers can comply with delivery requirements, their customers will perceive a good quality/price

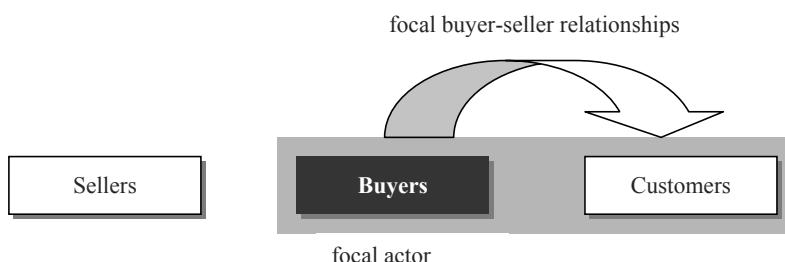


Figure 7.6. Focal buyer-seller relationships for buyers with downstream partners.

*Table 7.17. Path model estimates for the buyer sample with downstream partnerships (n=92).*

<b>Relationships</b>	<b>PLS estimation<sup>a</sup></b>	<b>Standard error</b>	<b>t statistics</b>	<b>Sig. level<sup>b</sup></b>
Guanxi networks → Transaction specific investments	0.33	0.10	3.36	***
Guanxi networks → Interpersonal trust	0.28	0.13	2.16	**
Guanxi networks → Contractual governance	0.25	0.11	2.34	**
Transaction specific investments → Compliance with quality requirements	0.34	0.18	1.79	
Transaction specific investments → Compliance with delivery requirements	-0.14	0.08	-1.80	
Transaction specific investments → Contractual governance	0.17	0.07	2.60	***
Interpersonal trust → Transaction specific investments	-0.17	0.10	-1.68	
Interpersonal trust → Compliance with quality requirements	0.21	0.13	1.57	
Interpersonal trust → Compliance with delivery requirements	0.30	0.11	2.75	***
Interpersonal trust → Contractual governance	0.58	0.08	6.96	***
Contractual governance → Compliance with quality requirements	-0.10	0.10	-1.08	
Contractual governance → Compliance with delivery requirements	0.56	0.10	5.83	***
Compliance with quality requirements → Quality/price satisfaction	-0.13	0.09	-1.38	
Compliance with quality requirements → Profitability	-0.21	0.11	-1.87	
Compliance with delivery requirements → Quality/price satisfaction	0.65	0.06	11.67	***
Compliance with delivery requirements → Profitability	0.23	0.11	2.12	**

<sup>a</sup> Sign and path coefficients of the hypothesised relationships (direct effect)

<sup>b</sup> \*\*\*: p<0.01; \*\*: p<0.05.

Note: Average  $R^2 = 0.272$

satisfaction and achieve a high level of profitability. The compliance with quality requirements, however, does not affect performance.

Figure 7.7 depicts all significant paths among *guanxi* networks, buyer-seller relationships and performance for vegetable buyers in relationships with downstream partners. The thick arrows indicate the most important significant paths. Following the thick arrows and looking back from performance indicators, we are able to identify the most important routes for the vegetable buyers to achieve good performance. Similar to the farmer sample, quality/price satisfaction is the most important performance attributes for vegetable buyers as indicated in Figure 7.7. A higher level of quality/price satisfaction can be realised through a better compliance with the customers' delivery requirements, the better compliance with the customers' delivery requirements can be achieved by using contractual governance, and the use of contractual governance can be promoted by a higher level of interpersonal trust. Finally, the higher level of interpersonal trust can be realised by the support obtained from *guanxi* networks.

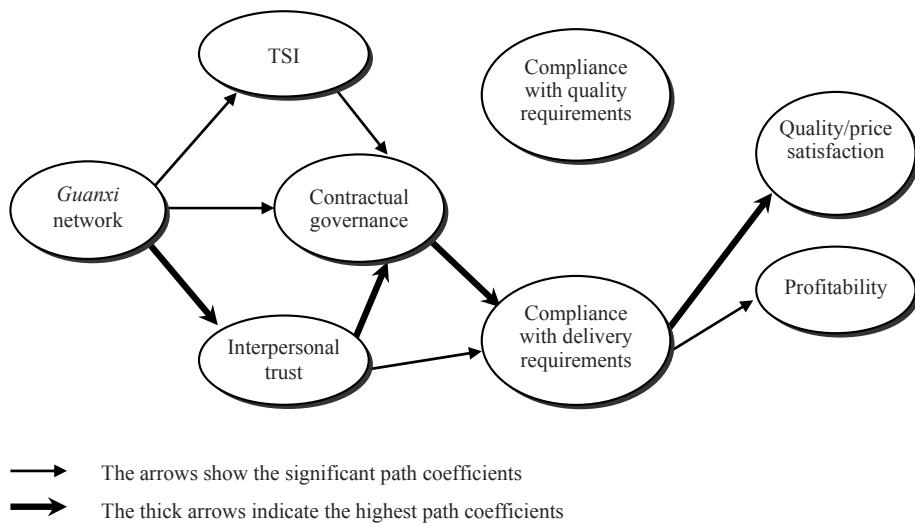


Figure 7.7. The significant relationships for the buyer sample with downstream partners.

## 7.8 Factors determining marketing channel choices

Finally, we investigate the factors determining the choice of marketing channels for the farmers and buyers respectively. The farmers and buyers that participate in certain marketing channels may be influenced by their personal characteristics, the resources they possess and the social capital they own (Lu, 2003; Milagrosa, 2007). For channel choices, common practice is applying a binary or multinomial logit model, depending on the number of marketing channels. The estimation coefficients predict the relative probability of the farmers and buyers choosing a channel over another. Because the meanings of the estimates are not always straightforward, marginal effects are computed from parameter estimates to give a better explanation of the results (Greene, 2003:722).

### 7.8.1 Factors determining marketing channel choice for vegetable farmers

The marginal effects of the factors that affect farmers' market channel choice<sup>35</sup> are presented in Table 7.18. The model has a pseudo  $R^2$  of 0.42 and correctly predicted 113 of the 167 cases (67.7%). We check the possible multicollinearity of the model by calculating the variance inflation factor (VIF). The maximum VIF in the model is 1.89, which is well below the rule-of-thumb threshold of 10 (Neter *et al.*, 1990). Thus we dismiss the multicollinearity problem in the model.

The support obtained from the farmers' *guanxi* networks does not significantly influence farmers' choice of marketing channels. TSI increase the farmers' probability of marketing their vegetables at the wet markets while decrease the farmers' probability of marketing their vegetables at the wholesale markets. As indicated in Chapter 2, farmers are able to obtain much more added value at the wet markets than at the wholesale markets. Therefore, farmers are more likely to sell their vegetables and pursue a higher level of profit at the wet markets with a higher level of TSI. This is consistent with the previous finding at the same area that the fixed stall is a significant TSI for farmers to sell their vegetables at the wet markets. Renting a stall significantly increases the possibilities for farmers to stick to the wet markets while not shift to other outlets (Lu, 2003).

Interpersonal trust significantly increases the farmers' probability of selling vegetables to the traders at the field or at the wholesale markets while reduces the farmers' probability of selling vegetables at the wet markets. This is because interpersonal trust is less required in spot market based transactions.

Males are more likely to sell vegetables to traders at the field because they usually have local nonfarm jobs and therefore do not have enough time to sell their vegetables to other market outlets. Females prefer to sell vegetables at the wet markets because they are capable of negotiating a good price (Lu, 2003). Less educated farmers are more likely to sell their vegetables to traders at the field, but less likely to sell their vegetables to the wholesale markets. The years of experience in vegetable business significantly reduces the farmers' possibility of selling their vegetables at the field. This is because experienced farmers have sufficient knowledge to deliver their products to the right markets.

Farm size increases the farmers' likelihood of marketing their vegetables at the wholesale markets but decreases the farmers' likelihood of marketing their vegetables at the wet markets. This is because large farm size usually leads to high yield which requires the delivery to the wholesale markets. Farmers possessing high-value transportation vehicles are more likely to sell their vegetables to processing companies, and less likely to sell their vegetables at the wet

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<sup>35</sup> The estimation results of the factors affecting farmers' marketing channel choices are presented in Appendix E.1.

Table 7.18. Marginal effects of farmers' marketing channel choice (multinomial logit analysis).

Independent variables	Field traders	Wet markets	Wholesale markets	Processing companies
Support from <i>guanxi</i> networks (factor score)	0.003 (0.06)	0.09 (0.08)	-0.07 (0.08)	-0.03 (0.02)
Transaction specific investments (factor score)	-0.02 (0.05)	0.19 (0.09)**	-0.19 (0.07)***	0.02 (0.02)
Interpersonal trust (factor score)	0.23 (0.06)***	-0.43 (0.08)***	0.20 (0.08)**	-0.004 (0.02)
Compliance with delivery requirements (factor score)	-0.09 (0.05)	0.02 (0.07)	0.07 (0.07)	-0.004 (0.01)
Sex of the interviewee (1=male, 0=female)	0.23 (0.08)***	-0.21 (0.11)**	-0.01 (0.11)	-0.01 (0.03)
Education level of the interviewee (0,1,2,3)	-0.14 (0.05)***	0.03 (0.06)	0.12 (0.06)***	0.02 (0.02)
Vegetable experience of the interviewee (year)	-0.01 (0.004)**	0.003 (0.004)	0.004 (0.004)	0.001 (0.001)
Total farmland of the interviewee (ha)	-0.13 (0.25)	-1.56 (0.44)***	1.72 (0.40)***	-0.03 (0.07)
Own high-value vehicles (1=yes)	0.02 (0.08)	-0.27 (0.09)***	-0.17 (0.11)	0.42 (0.09)***
Perceived risk (1-5 Likert scale, reversed variable)	-0.14 (0.08)*	-0.19 (0.12)	0.29 (0.16)*	0.04 (0.05)

Notes: \*\*\*: p<0.01, \*\*: p<0.05; \*: p<0.10; Sample size: 167;

Log Pesudo Likelihood = -127.12; Pesudo R2 =0.42;

Predict accuracy: 67.7%; Average VIF: 1.43; Maximum VIF: 1.89.

markets. This is because high-value transportation vehicles are usually used to deliver large quantities of vegetables, and are therefore not used to deliver vegetables to the wet markets.

Farmers who perceive a high risk are more likely to choose to sell their vegetables at the field due to convenience and time saving, or chose to sell their vegetables to the wholesale markets due to the high demand in these markets.

## 7.8.2 Factors determining vegetable sourcing channel choice for vegetable buyers

We identified three important vegetable sourcing channels for vegetable processing and exporting companies and supermarkets: individual farmers, traders (or sometimes called brokers) and domestic food companies. Sample size (84) is very limited and they are unequally distributed in different channels. The largest group has 61 samples while the smallest group has only seven samples (see Table 7.9, left side). Therefore, we are not able to model the buyers' vegetable sourcing channel choices by multinomial model. Alternatively, we use the binary model to perform estimations for each sourcing channel. The marginal effects of the factors that affect vegetable buyers' sourcing channel choice are presented in Table 7.19<sup>36</sup>. The pseudo  $R^2$  for all models are above 0.25. Models correctly predicted more than 82% of cases (see Table 7.19). The maximum VIF in the model is 3.56, which is well below the rule-of-thumb threshold of 10. Thus we dismiss the multicollinearity problem for all the models.

The support obtained from vegetable buyers' *guanxi* networks has a positive effect on the buyers' probability of buying vegetables from traders. This is because transactions with traders are more relation based. Thus *guanxi* plays an important role here.

TSI and interpersonal trust have no significant impact on the buyers' vegetable sourcing channel choice. Perceived efficiency increases the buyers' possibility of buying vegetables from domestic food companies. This is because buying vegetables from these companies involves less time and less cost. Rich vegetable market experience reduces the buyers' possibility of buying vegetables from traders. Furthermore, if vegetable processing and exporting companies are specialised in vegetable business, they prefer to buy vegetables directly from farmers for freshness.

## 7.8.3 Factors determining vegetable destination channel choice for vegetable buyers

We identified five important vegetable destination channels for vegetable processing and exporting companies, supermarkets and production companies: international markets, domestic food companies, domestic wholesale markets, supermarkets, and domestic consumers. Due to the limited sample size (92) and their unequal distribution in different channels (see Table 7.9, right side), we perform binary logit model as well. The marginal effects of the factors that affect vegetable buyers' destination channel choice are presented in Table 7.20<sup>37</sup>. The pseudo  $R^2$  for all models are over 0.26. Models correctly predicted more than 81% of cases.

<sup>36</sup> The estimation results of the factors affecting vegetable buyers' sourcing channel choice are presented in Appendix E.2.

<sup>37</sup> The estimation results of the factors that affect vegetable buyers' destination channel choice are presented in Appendix E.3

Table 7.19. Marginal effects of vegetable processing and exporting companies' marketing channel choice in purchasing vegetables (binary logit analysis).

Independent variables	Farmers	Traders	Domestic food companies
Support from <i>guanxi</i> networks (factor score)	-0.07 (0.05)	0.04 (0.02)**	-0.02 (0.02)
Transaction specific investments (factor score)	0.03 (0.04)	-0.02 (0.01)	-0.01 (0.01)
Interpersonal trust (factor score)	0.04 (0.07)	0.001 (0.02)	0.03 (0.03)
Compliance with delivery requirements (factor score)	-0.07 (0.08)	-0.04 (0.02)	-0.00 (0.02)
Efficiency (factor score)	-0.09 (0.06)	0.02 (0.01)	0.05 (0.03)*
Vegetable business experience (years)	0.01 (0.01)	-0.005 (0.003)*	-0.00 (0.00)
Vegetable specialisation (%)	0.01 (0.002)***	-0.00 (0.00)	n.a.
Total sales	-0.379 (0.05)	0.03 (0.03)	0.00 (0.01)
Log Pseudo likelihood	-35.37	-18.14	-18.95
Pseudo R2	0.28	0.25	0.38
Predict accuracy (%)	82.1%	92.9%	90.5%

Notes: \*\*\*: p<0.01, \*\*: p<0.05; \*: p<0.10; Sample size: 84;

Average VIF: 1.89; Maximum VIF: 3.56.

The maximum VIF for all variables is 4.25. Thus there is no multicollinearity problem in the model (see Table 7.20).

The support obtained from the buyers' *guanxi* networks positively affects the buyers' probability of selling vegetables to domestic food companies and negatively affect the buyers' probability of selling vegetables directly to domestic consumers. Vegetable markets involve strong competition. The buyers have to rely on their personal relationships to find the right market and to trade with the right partners. *Guanxi* networks prevail in domestic markets and play a significant role on business.

TSI positively affects the buyers' probability of selling vegetables directly to domestic consumers since TSI are required at the wet markets. This is consistent with the previous finding in the same research area (Lu, 2003). Interpersonal trust is positively associated with the buyers' probability of selling vegetables to international markets, while negatively associated with the buyers' probability of selling vegetables to domestic food companies. This is because interpersonal trust is highly required in international markets.

Table 7.20. Marginal effects of vegetable processing and exporting companies' marketing channel choice in selling vegetables (binary logit analysis).

Independent variables	International markets	Domestic food companies	Domestic wholesale markets	Supermarkets	Domestic consumers
Support from <i>guanxi</i> networks (factor score)	-0.08 (0.09)	0.08 (0.04)**	0.01 (0.01)	-0.00 (0.01)	-0.04 (0.02)*
Transaction specific investments (factor score)	-0.04 (0.07)	0.01 (0.02)	-0.01 (0.01)	-0.005 (0.003)	0.07 (0.03)**
Interpersonal trust (factor score)	0.20 (0.10)**	-0.08 (0.04)**	0.003 (0.01)	0.004 (0.01)	-0.02 (0.03)
Compliance with delivery requirements (factor score)	0.28 (0.11)***	0.01 (0.03)	-0.04 (0.02)**	0.02 (0.01)**	-0.05 (0.31)**
Efficiency (factor score)	-0.05 (0.08)	0.01 (0.02)	0.02 (0.01)	-0.002 (0.00)	-0.02 (0.02)
Vegetable business experience (years)	0.04 (0.01)***	-0.02 (0.01)***	-0.003 (0.002)	-0.002 (0.00)**	0.00 (0.00)
Total sales	0.16 (0.09)*	0.00 (0.00)***	-0.003 (0.01)	0.002 (0.005)	-0.04 (0.03)
Vegetable specialisation (%)	-0.00 (0.00)	0.00 (0.00)	0.001 (0.00)	n.a.	-0.00 (0.00)
Pollution-free vegetable dummy	0.05 (0.16)	-0.03 (0.06)	-0.02 (0.03)	0.01 (0.01)	0.32 (0.06)
Perceived risk (5 Likert scale)	-0.19 (0.18)	-0.07 (0.05)	0.04 (0.04)	0.001 (0.008)	n.a.
Log Pseudo likelihood	-39.38	-31.34	-18.10	-16.61	-23.29
Pseudo R2	0.38	0.26	0.39	0.33	0.45
Predict accuracy (%)	81.5%	82.6%	90.2%	92.4%	89.1%

Notes: \*\*\*: p<0.01, \*\*: p<0.05, \*: p<0.10; Sample size: 92

Average VIF: 1.87; Maximum VIF: 4.25.

The compliance with the customers' delivery requirements has significant impacts on the buyers' selling vegetables to nearly all channels. The compliance with delivery requirements increases the buyers' probability of selling vegetables to international markets and supermarkets, while decreases the buyers' probability of selling vegetables to domestic wholesale markets and

consumers. This implies that if the buyers are able to comply with their customers' delivery requirements, they are perceived as good suppliers thus have more opportunities to access to international markets and supermarkets.

Rich vegetable market experience increases the buyers' possibility of selling their vegetables to the international markets but decreases the buyers' possibility of selling vegetables to domestic food companies and supermarkets. International business requires extensive business relationships and knowledge. The buyers (sellers in this buyer-seller relationship) with rich market experience have build up large business networks and achieved more knowledge, and thus have more opportunities to find international customers and maintain long-term business relationships. Large-scale buyers, in terms of total sales, are more likely to access to international markets and domestic food companies because of their stable and high-quality supply.

## **7.9 Concluding remarks**

This chapter discussed the questionnaire survey results, which extended and validated the case study results in the previous chapter. The quantitative analysis described the sample characteristics and discussed the reliability and validity of both formative constructs (*guanxi* networks, compliance with delivery requirements and contractual governance) and reflective constructs (transaction specific investments, interpersonal trust, compliance quality requirements, and performance indicators).

The estimation of the structural model was based on three different buyer-seller relationships. The propositions were tested by estimating a structural model in PLS. The results are to a great extent in line with the findings of the case study. However, significant differences are found in different buyer-seller relationships and for different market outlets, providing significant practical and managerial evidence to improve the effectiveness and efficiency of the vegetable supply chains in the research area. Based on the investigations of the factors determining marketing channel choice, we further expanded our understanding of the market participation decisions for both vegetable farmers and buyers. We will draw conclusions based on the findings of the case study and survey analysis in chapter 8.



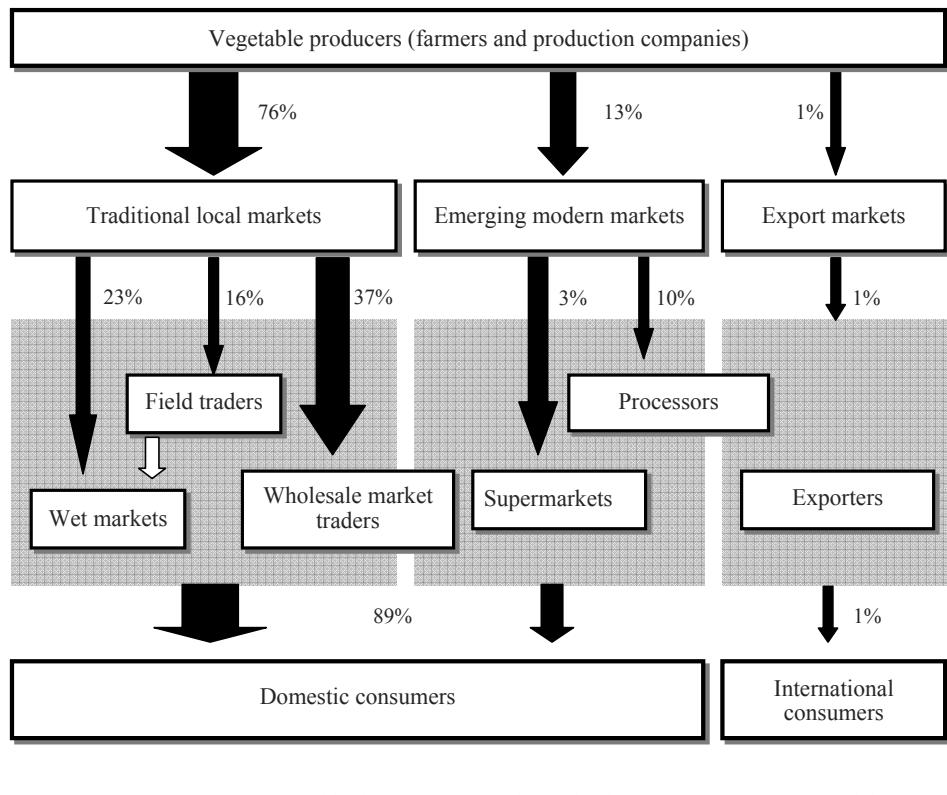
# Chapter 8 Discussion and conclusions

The objective of this study is to identify the governance mechanisms that support market performance in Chinese vegetable supply chains. From a supply chain perspective, this study examined buyer-seller relationships (interpersonal trust, transaction specific investments and contractual governance) and chain performance in vegetable supply chains in Jiangsu Province. In particular, we investigated the impact of the Chinese culturally embedded concept of *guanxi* networks on buyer-seller relationships and on market performance. In order to answer the two research questions: *'Do guanxi networks improve the integration of buyer-seller relationships and ultimately, market performance in vegetable supply chains in China? and Is there any difference in the use and the effect of guanxi networks in upstream and downstream buyer-seller relationships and traditional and modern high-value market outlets?'*, we discussed the vegetable sector in China in general and in Jiangsu Province in particular in Chapter 2. Theories related with buyer-seller relationships (e.g. social capital and network theory) and business transactions (e.g. supply chain management and transaction cost economics) are reviewed in Chapter 3. The research model is developed and several propositions are defined in Chapter 4. Case study and questionnaire survey are designed and data analysis methods are discussed in Chapter 5. The interrelations among *guanxi* networks, buyer-seller relationships and market performance are discussed using case study analysis in Chapter 6 and questionnaire survey analysis in Chapter 7. This final chapter (Chapter 8) draws the major conclusions of this study. This chapter starts with the discussion of vegetable distribution in Jiangsu Province in Section 8.1. The major conclusions regarding the research questions and propositions are drawn in Section 8.2. We discuss the theoretical contributions in Section 8.3, the methodological implications in Section 8.4, and the limitations in Section 8.5. This chapter ends with managerial implications for supply chain participants and managers and for policy makers.

## 8.1 Vegetable distribution in supply chain networks

As discussed in Chapter 2, vegetable producers (individual farmers and company-based producers) can sell their products through multiple channels. Based on the number of farmers in each channel and the size of their farmland, we calculated the proportion of the vegetables distributed to each market channel (see Figure 8.1).

The traditional local market plays a dominant role in vegetable marketing in Jiangsu Province. Traders at the wholesale markets are the major vegetable buyers. They purchase about 37% of the vegetables. The second important market outlet is the wet markets. Although the number of the wet markets in either rural or urban areas has been declining for the last several years (see Table 2.1), the 68,000 wet markets still play an important role in vegetable marketing. About 23% of the vegetables are directly sold by vegetable producers at the wet markets. The third important market outlet is traders who come to the field. About 16% of the vegetables are



→ Arrows indicate vegetable flows. Numbers indicate the share of vegetables distributed through different channels.

Figure 8.1. Vegetable distribution networks in Jiangsu Province, China.

Source: own survey.

collected by field traders. We should also mention that part of the vegetables may flow to the emerging modern markets (e.g. processing companies) via traders at the wholesale markets.

Processing companies and supermarkets are emerging modern market outlets. In total about 13% of the vegetables are sold through these markets. In which, 10% of the vegetables are sold to processing companies; the rest (about 3%) are sold to supermarkets. Most of the small-scale producers, however, do not have direct access to supermarkets in Jiangsu Province. Only company-based large producers and organised farmers (through cooperatives or farmer associations) have the possibility to sell vegetables directly to supermarkets.

Export markets only account for a small part of vegetables. About 1% of the vegetables are sold to the international market through exporting companies. Some processing companies are also able to export vegetables to international markets without using exporting companies. This is because the reform of trade policies in China. These processing companies possess the

so-called 'Self-Administrative Import & Export Certificate', with which they can function as exporters as well.

Since we did not interview sufficient cases of all participants in vegetable supply chains (especially traders and exporters)<sup>38</sup>, we are not able to identify the vegetable flows in the middle part of the supply chains (the shadow part in Figure 8.1). Thus we treat this part as a black box without indicating the real vegetable flows. Based on field interviews and secondary sources, it is estimated that about 1% of the fresh, frozen or dried vegetables are exported to international markets. The rest of the vegetables are consumed in domestic markets. At least 10% of total vegetables are wasted throughout the supply chains and are not able to reach consumers.

## 8.2 Guanxi networks, buyer-seller relationships and market performance

From a supply chain perspective, we defined the propositions about the effects of *guanxi* networks on buyer-seller relationships and market performance (see Figure 8.2). Taking into account the differences in market channels (traditional vs. modern outlets) and buyer-seller relationships (upstream vs. downstream partnerships), *guanxi* networks are evaluated in terms of the support obtained from *guanxi* networks through information sharing, financial and technical assistance and facilitation of market access. Buyer-seller relationships in this study include interpersonal trust, transaction specific investments and contractual governance. Performance is measured in two steps. We first identify the compliance with quality and delivery requirements as the consequence of the integration of buyer-seller relationships. We then investigate how compliance with quality and delivery requirements contributes to efficiency, quality/price satisfaction and eventually profitability.

We modelled specific dyadic relationships for vegetable sellers and buyers, separately. Three typical buyer-seller relationships are identified in the vegetable sector: vegetable farmers in relationships with their buyers (see Figure 7.2), vegetable buyers in relationships with upstream partners (suppliers, Figure 7.4), and vegetable buyers in relationships with downstream partners (customers, Figure 7.6). This distinction is very important because the sellers and buyers have different positions in different buyer-seller relationships. They possess different market information, face different market challenges, and have different negotiation powers. As a result, they may behave differently in different buyer-seller relationships. By comparing different types of buyer-seller relationships, we are able to distinguish the importance of *guanxi* networks in different buyer-seller relationships.

<sup>38</sup> Due to the time limitation, we were not able to interview enough traders in the research area for statistical analysis. We did interview seven traders. Their information has been integrated in the description of the research area in case study analysis in Chapter 6.

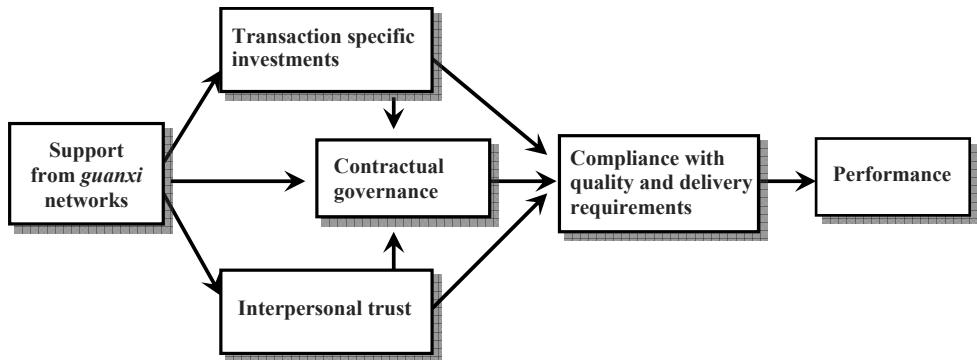


Figure 8.2. Conceptual model.

### 8.2.1 *Guanxi* networks and buyer-seller relationships in the chains

Based on case study and questionnaire survey analysis on *guanxi* networks and buyer-seller relationships in vegetable supply chains, we conclude that:

- *Guanxi* networks are perceived as an important factor in social life and in doing business in China. Both vegetable sellers and buyers recognise the significant supportive effects of *guanxi* networks on vegetable transactions in terms of information sharing, technical and financial assistance and transaction facilitation.
- *Guanxi* plays a key role in traditional domestic markets (such as wholesale and wet markets). *Guanxi* is also very important for vegetable sellers to build international business relationships. Expanding the common perception of *guanxi* being important for doing business in China by foreigners, *guanxi* also comes out as important for entering into international markets by Chinese processors and exporters.
- Different chain participants tend to use *guanxi* differently. Individual farmers use their *guanxi* networks to find buyers and to get access to the markets. Large-scale companies (processing companies, exporting companies and supermarkets) rely on their *guanxi* networks to maintain long-term relationships and expand their businesses in international markets. In the vegetable purchasing process, however, they tend to make less use of *guanxi*.
- Transaction specific investments are important to build preferred business relationships. TSI are more important in relationships with downstream partners compared to relationships with upstream partners. TSI are also perceived as more important in emerging and international markets compared to traditional markets.
- Interpersonal trust is a critical factor in buyer-seller relationships both in relationships with downstream partners and in relationships with upstream partners. Compared to domestic markets, interpersonal trust is more important in international markets. Within the Chinese border, building interpersonal trust turns out to be most important in emerging modern

markets (such as supermarkets); this is probably because new buyer-seller relationships have to be built in emerging modern markets.

- Formal and informal governance mechanisms are all important in achieving good market performance in China. Formal contract-based transactions improve market performance via delivery requirements compliance and quality/price satisfaction. Informal governance reduce transaction costs, build trusting buyer-seller relationships and safeguard transactions in an efficient manner, which may eventually lead to good market performance in vegetable supply chains.
- Participation in a certain market channel depends not only on *guanxi*-based business relationships, of course, but also on the quality of transportation facilities and the scale of production. Big farmers are able to deliver large volumes of vegetables to wholesale markets and do business with large buyers. High-value transportation facilities improve the ability to deliver products to buyers and thus improve market access. Only organised vegetable producers and large vegetable production companies with long-term market experience are able to comply with delivery requirements of processing and exporting companies and supermarkets.

### 8.2.2 The impact of *guanxi* networks on buyer-seller relationships

In order to answer the first part of the research question '*Do guanxi networks improve the integration of buyer-seller relationships and ultimately, market performance in vegetable supply chains in China?*', we defined several propositions regarding the effects *guanxi* networks on buyer-seller relationships (transaction specific investments, interpersonal trust and contractual governance, see Figure 8.3). The case study and questionnaire survey results indicated that *guanxi* networks improve the integration of buyer-seller relationships.

- To a great extent, *guanxi* networks have strong direct and indirect impacts on buyer-seller relationships. *Guanxi* networks support vegetable sellers (farmers) and buyers (processing and exporting companies and supermarkets) in vegetable business. Transaction

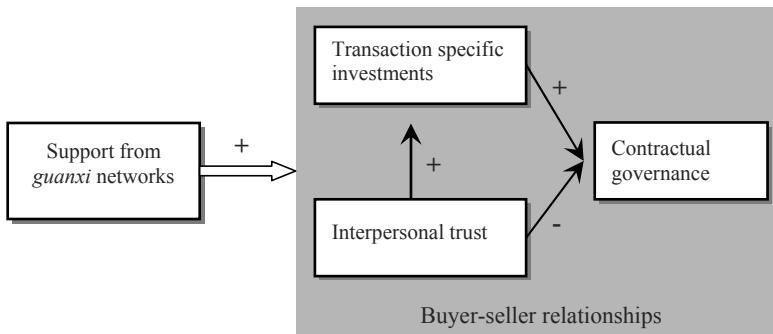


Figure 8.3. Defined propositions between *guanxi* networks and buyer-seller relationships.

specific investments are perceived as an important concept in buyer-seller relationships. However, TSI are only affected by the support from *guanxi* networks in relationships with downstream partners.

- The effects of *guanxi* networks on buyer-seller relationships are stronger in relationships with downstream partners than those in relationships with upstream partners. This is consistent with the findings of Claro (2004). *Guanxi* networks are required to sell vegetables in high competitive markets, while *guanxi* networks are not necessary to buy vegetables in a buyer dominated market environment.
- *Guanxi* networks and interpersonal trust promote contractual transactions in relationships with downstream partners, especially in transactions of processing and exporting companies. The positive effect of *guanxi* networks and interpersonal trust on contractual governance indicates the complementary effect of relational governance and formal governance (contracts) in China. This is consistent with previous studies on *guanxi* in China (Potter, 2002; Schramm and Taube, 2003). They concluded that *guanxi* will prevail in Chinese business and will co-existent with formal governance in the future. The combination of formal and informal governance mechanisms, therefore, seems to be the best way to organise vegetable supply chains in China. This, in turn, answers the central research question of this study.

### 8.2.3 The impact of buyer-seller relationships on market performance

In order to answer the second part of the research question '*Do guanxi networks improve the integration of buyer-seller relationships and ultimately, market performance in vegetable supply chains in China?*', we defined several propositions regarding the effects of buyer-seller relationships (interpersonal trust, transaction specific investments and contractual governance) on market performance (compliance with quality and delivery requirements, efficiency, quality/price satisfaction and profitability, see Figure 8.4). The case study and questionnaire survey analysis suggested that the integration of buyer-seller relationships improves market performance.

- Interpersonal trust is the most important factor to achieve good market performance for both sellers and buyers in the vegetable sector. Interpersonal trust significantly improves the ability to comply with delivery requirements for vegetable sellers (individual farmers and large-scale production companies, processing and exporting companies); In turn, this leads to good market performance, especially high quality/price satisfaction and profitability.
- Quality/price satisfaction is the most import performance attribute in relationships with downstream partners, while price is more concerned in relations with upstream partners. Vegetable suppliers are able to survive in the market only if they are capable of delivering high-quality vegetables to their buyers. Vegetable buyers, on the other hand, are not only concerned about quality aspects, but also try to purchase vegetables with low prices in order to reduce costs and make profits.
- The ability to comply with delivery requirements significantly contributes to market performance for both the sellers and buyers. Quality/price satisfaction is higher in

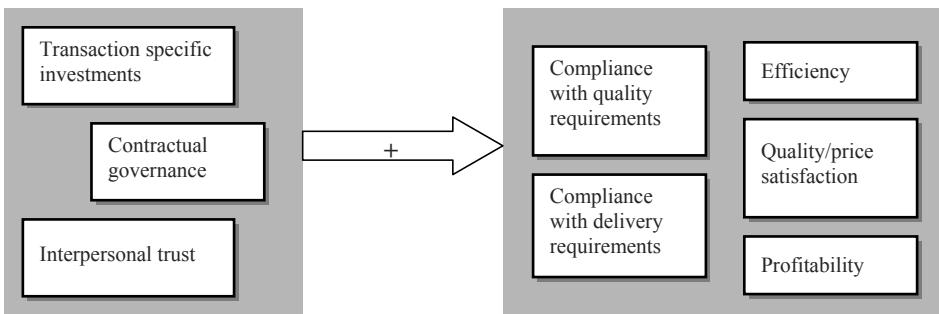


Figure 8.4. Defined propositions between buyer-seller relationships and performance.

relationships with downstream partners compared to upstream partners. Quality/price satisfaction is significantly associated with the compliance with delivery requirements, which is further enhanced in a trusting buyer-seller relationship. Thus vegetable sellers and buyers should build trusted buyer-seller relationships and enhance delivery capabilities to achieve good market performance.

- Contractual governance shows a significant 'mediating effect'<sup>39</sup> between interpersonal trust and compliance with delivery requirements. In this study, the inclusion of contractual governance in the model significantly reduces the relation between interpersonal trust and compliance with delivery requirements, while the relations between interpersonal trust and contractual governance, and compliance with delivery requirements and contractual governance are both significant. Therefore, we identify contractual governance as a mediator variable in relation between interpersonal trust and compliance with delivery requirements. This implies that governance mechanisms can partly take over the effects of interpersonal trust on compliance with channel requirements in business practice.

#### 8.2.4 Paths to achieve performance

By excluding the non-significant path coefficients, we identify the relations focusing on the significant paths (see Figure 7.3, 7.5 and 7.7). We notice that there are several similarities for the sellers and buyers in their paths to achieve performance. The most important path to achieve performance involves interpersonal trust, compliance with delivery conditions and quality/price satisfaction for all three buyer-seller relationships. Both the farmer and buyer

<sup>39</sup> Mediating effect is the presence of mediator variables. A mediator variable is the one that explains the relationship between the two other variables. 'In general, a given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion. Mediators explain how external physical events take on internal psychological significance' (Baron and Kenny, 1986). The general test for mediation is to examine the relation between the predictor and the criterion variables, the relation between the predictor and the mediator variables, and the relation between the mediator and criterion variables. All of these correlations should be significant. The relation between predictor and criterion should be reduced (to zero in the case of total mediation) after controlling the relation between the mediator and criterion variables.

sample indicate that interpersonal trust is key to comply with channel requirements and crucial to achieve superior performance.

A significant distinction is found in the paths to achieve market performance for the sellers and the buyers (see Figure 8.5 and 8.6). In relationships with downstream partners, vegetable producers (farmers) and processing and exporting companies use the following path to achieve performance (see Figure 8.5).

The suppliers rely on their *guanxi* networks to get in contact with the buyers they can trust in case of vegetable smallholders, or with new (international) buyers in case of vegetable processing and exporting companies. On the basis of interpersonal trust, the sellers that are best helped by formal contracts are able to achieve efficiency, quality/price satisfaction and ultimately profitability if they are able to comply with the delivery requirements. Particularly, contractual governance shows a significant mediating effect on the relation between interpersonal trust and compliance with delivery requirements.

The questionnaire survey results are consistent with the findings from the case study. Modern Chinese vegetable chains are internationally oriented. Quality is the 'brick' to knock on the 'door' of international markets. In order to access to international markets and to achieve a good performance, vegetable producers and processing and exporting companies may have to rely on their *guanxi* networks and build up long-term buyer-seller relationships with improved delivery capacity to comply with the requirements of the international buyers.

Contract farming and organisations (e.g. farmer cooperatives or associations) may be the possible future for numerous smallholders. Vegetable processing and exporting companies, on the other hand, may use contracts to reduce risks and to pursue good performance in international markets.

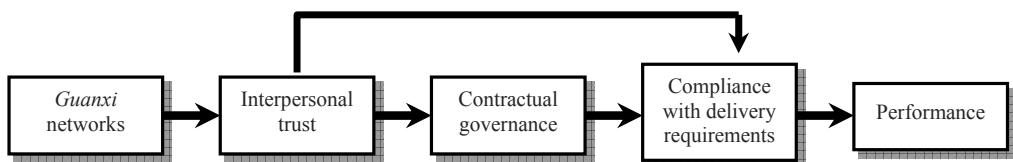


Figure 8.5. Path to achieve performance for sellers in relation with downstream partners.

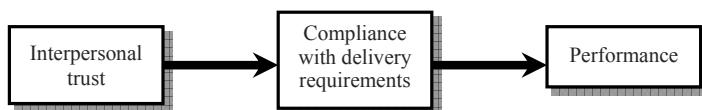


Figure 8.6. Path to achieve performance for buyers in relation with upstream partners.

For vegetable buyers (processing and exporting companies and supermarkets) in relationships with their upstream partners (vegetable suppliers), the path to achieve performance is as Figure 8.6.

Based on interpersonal trust, the buyers can improve market performance if the suppliers comply with their delivery requirements. This is consistent with the framework of customer relationship management, interpersonal trust is important for market performance (Rigby *et al.*, 2002; Claro, 2004). Interestingly, *guanxi* networks and contractual governance did not play significant roles in this relationship. In a buyer dominated vegetable market, buyers face less problems in acquiring sufficient good quality vegetables. The buyers' negotiation power is so high that it is apparently not necessary to use their *guanxi* networks to facilitate their business or to find new suppliers.

The different paths shown in Figure 8.5 and Figure 8.6 underline the different approaches to achieve market performance for vegetable sellers and buyers in different buyer-seller relationships. This answers the second research question of '*Is there any difference in the use and the effect of guanxi networks in upstream and downstream buyer-seller relationships and traditional and modern high-value market outlets?*'

### 8.2.5 Summary of testing the propositions

Based on the results of case study in Chapter 6 and questionnaire survey in Chapter 7 and the discussions in this chapter (Section 8.2), the summary of testing the major propositions is presented in Table 8.1.

## 8.3 Theoretical contributions

This study proposes to combine theories of supply chain management, social capital and transaction cost economics (TCE) to explain buyer-seller relationships (interpersonal trust, TSI and contractual governance) in a supply chain framework. Specifically, we complement the emphasis of TCE on transaction specific investments with relational governance and trust. The complementarities of these theories are emphasised when developing our theoretical framework. We focus on a culturally embedded concept, *guanxi* networks, in buyer-seller relationships in Chinese vegetable supply chains. We characterise *guanxi* networks by the support obtained from connected relationships in the chains (upstream and downstream relationships), and buyer-seller relationships by transaction specific investments, interpersonal trust and contractual governance. We argue that the support obtained from *guanxi* networks improves the integration of buyer-seller relationships (higher level of interpersonal trust, TSI and contractual governance). In this study, we made several contributions to the existing theories.

First, the empirical evaluation of *guanxi* networks contributes to network theory. Granovetter (1985) and Powell (1990) emphasised the importance of the business network in increasing

*Table 8.1. Confrontation of the propositions with the empirical results.*

<b>Hypotheses</b>	<b>Farmer sample</b>	<b>Buyer sample (upstream)</b>	<b>Buyer sample (downstream)</b>
<b>Impact of guanxi networks</b>			
H1a: Support from <i>guanxi</i> networks → transaction specific investments	supported	supported	supported
H1b: Support from <i>guanxi</i> networks → interpersonal trust	supported	supported	supported
H1e: Support from <i>guanxi</i> networks → contractual governance	not supported	supported	supported
<b>Impact of buyer-seller relationships</b>			
H2a: TSI → compliance with quality requirements	supported	supported	not supported
H2b: TSI → compliance with delivery requirements	not supported	supported	not supported
H2d: TSI → contractual governance	not supported	negative effect	supported
H3a: Interpersonal trust → compliance with quality requirements	not supported	supported	not supported
H3b: Interpersonal trust → compliance with delivery requirements	supported	supported	supported
H3d: Interpersonal trust → contractual governance	negative effect	negative effect	negative effect
H4: TSI → Interpersonal trust	supported	not supported	not supported
H5a: Contractual governance → compliance with quality requirements	not supported	supported	not supported
H5b: Contractual governance → compliance with delivery requirements	supported	supported	supported
<b>Impact on performance</b>			
H6a: Compliance with quality requirements → performance	supported <sup>a</sup>	not supported	not supported
H6b: Compliance with delivery requirements → performance	supported	supported <sup>b</sup>	supported <sup>c</sup>

<sup>a</sup> only for quality/price satisfaction

<sup>b</sup> only for price satisfaction

<sup>c</sup> only for quality/price satisfaction and profitability

the level of trust, and highlighted that the support obtained from the network functions as a mechanism for safeguarding transaction specific investments and collaboration. In this study, we found that the more the support that is obtained from *guanxi* networks, the more the sellers and/or buyers are encouraged to engage in collaborative forms of governance, invest in transaction specific assets and build up interpersonal trust. This finding provides empirical evidence for the theoretical discussion of Granovetter (1985) and Powell (1990).

Second, this study extended the application of relational governance and network theory to a transition economy. *Guanxi* is widely recognised as a form of relational governance and relationship marketing in a Chinese context (Arias, 1998; Wong and Chan, 1999; Wong and Leung, 2001; Wang, 2007). *Guanxi*, as a special form of relational governance, contributes to long-term relationship-building and safeguard against opportunism. This is coherent with the application of relationship marketing in the western world. However, *guanxi* also contributes to short-term business relationships in China. *Guanxi* makes it possible for the sellers and buyers to diversify their markets in the short-term and provides the sellers and buyers the opportunities to shift from one market (or partner) to another. These short-term effects extend the application of relationship marketing and relational governance from a time perspective. Moreover, empirical evidence proves that relational governance significantly improves chain performance in transition economy.

Third, this study confirmed the complementary effects of informal governance (*guanxi*) on formal governance (contracts). *Guanxi*, a cultural and social phenomenon, has existed in China for more than 2000 years. Guthrie (1998) studied *guanxi* as an institutionally defined system, and concluded that *guanxi* has a declining significance in China. Schramm and Taube (2003), on the other hand, observed that *guanxi* networks still prevail and will co-exist with the legal system in China for a considerable period of time. To our knowledge, no empirical research has been done until now to test the complementary effects of *guanxi* networks and formal governance in China. In this study, we indicated that there exists a complementary effect of informal governance (*guanxi*) on formal governance (contracts) in Chinese vegetable supply chains.

## 8.4 Methodological implications

The present study made several important methodological contributions. First of all, we applied a two-step procedure to test the theoretical framework developed in this study. We started with a qualitative case study research to get a deep understanding of the concepts and the interrelations among *guanxi* networks, buyer-seller relationships and market performance. This was followed by a quantitative analysis using questionnaire survey for both vegetable sellers and buyers. The combination of qualitative and quantitative approaches in a single study allowed us to minimise the drawbacks of each research approach. The case study enabled us to break down the broad, vague concepts of *guanxi* networks and buyer-seller relationships into smaller, more precise constructs. These, in turn, helped us to formulate propositions that can

be tested in a survey context. The analysis and the interpretation of the statistical results of the survey data were further assisted by the case study. The questionnaire survey, on the other hand, allowed us to generalise the findings.

Second, we applied a component based structural model, PLS, to analyse the relationships among *guanxi* networks, buyer-seller relationships and market performance. This makes it possible to incorporate both formative and reflective constructs in one model. Distinguishing formative and reflective constructs requires different assessment methods for reliability and validity test. Consequently, the constructs may have a good reflection the reality. This, in turn, improves the quality of the structural model.

Third, our questionnaire is a result of iterative activities. A multiple-item questionnaire was initially designed based on the literature review and the research objectives. The questionnaire was tested in the first round with eight case interviews. The measurements of the major constructs, such as *guanxi* networks, interpersonal trust and transaction specific investments, were specially improved. After iterations of editing and refinement, a content analysis was performed to determine the overlap of the remaining items within the conceptual domain. Thereafter, forward and backward language translation for Chinese and English was performed to achieve translation equivalence. Well-designed questionnaires improved the quality of the empirical estimation.

Fourth, field personal interview is a successful and efficient way for collecting primary data in China. In this study, data collection was conducted by personal interviews. By doing so, we could solve several problems in data collection. Personal interviews enable us to collect data from those farmers who are less educated and are not able to fill in questionnaires themselves and who have poor access to internet and telephone. Personal interviews also enable us to acquire additional information regarding what the interviewees are thinking (not only what they have done). In addition, personal interviews can increase the response rate, which is usually a problem for the mailing questionnaire method. Finally, personal interviews help to expand personal relationships (*guanxi*) while doing research. Searching, identifying, contacting and interviewing are all activities that relied on the *guanxi* networks of the researcher. This is a good example of the benefits of *guanxi* networks in China.

Fifth, multinomial and binary logit analyses expanded the findings of the PLS model. We investigated the determinants affecting vegetable sellers' and buyers' marketing channel choices. The combination of the multinomial and binary logit model and the PLS model provided intensive insights into the relationship between *guanxi* networks, buyer-seller relationships and performance.

## 8.5 Limitations of the study and suggestions for further research

In this section, we discuss the limitations of this study and the directions for future research. First, the measurement for *guanxi* networks is deduced from the existing literature on network theory and empirical analysis. As discussed in Chapter 3, although *guanxi* networks share some common characteristics with network theory, they have their cultural and social specificities. In this study, we did not directly measure *guanxi* networks, such as the number of the connections, type of connections or the quality of the connections. Alternatively, we focused on the content of *guanxi* networks. In other words, we measured the support or benefits obtained from *guanxi* networks (market information, financial and technical assistance and markets access). Also, we did not distinguish the sources of *guanxi* networks (family *guanxi*, friend *guanxi* and business *guanxi*). However, different buyer-seller relationships focus on different types of *guanxi* networks. Thus a suggestion for further research would be to test the measurement for different subgroups (family *guanxi*, friend *guanxi* and business *guanxi*). Such research would certainly provide deeper insights into to what extent *guanxi* networks affect the other concepts, such as interpersonal trust, transaction specific investments and governance mechanisms.

Second, the data collected from the sellers and buyers provided important information about the similarities and differences between these two groups. Unfortunately, we were not able to identify the selected counterparts in each dataset because most of the sellers and buyers that participated in our interviews were not willing to provide personal information (such as name and address) of their most important counterparts because of the worries about leaking confidential business information. Thus this study pooled all data. Further research into the effects of *guanxi* networks on buyer-seller relationships and on market performance would aim at analysing both identified sides.

Third, this study used a cross-sectional survey design that prevents the investigation of the dynamic effects of *guanxi* networks on buyer-seller relationships and on market performance. We examined the direct and indirect impacts of *guanxi* networks on buyer-seller relationships and on market performance. However, we ignored the interrelations between buyer-seller relationships and performance indicators ( $TSI \rightarrow$  performance, trust  $\rightarrow$  performance). We also excluded the loop effects of performance on *guanxi* networks (performance  $\rightarrow$  *guanxi* networks). If there is a good performance, both sellers and buyers might be more willing to make transaction specific investments. However, proof of these causal (loop) relationships requires a longitudinal study design. Further work along this line is therefore encouraged.

Fourth, this study is carried out for a limited number of vegetable sellers and buyers in Jiangsu Province. This might prevent the generalisation of our conclusions. With a small sample, the correlation coefficients fluctuate much more than in large samples (Field, 2005). Therefore further research is suggested to replicate this study in different settings with a large sample

size. Following the 'rules of thumb', we suggest at least 300 cases (Hair *et al.*, 1998; Tabachnick and Fidell, 2001).

## **8.6 Managerial implications**

The vegetable sector in China is well known for its huge amount of production, increasing international orientation and the prominent role played by small-scale producers. Although the focal buyer-seller relationships examined in this study are within national boundaries, both sellers and buyers are more and more aiming at international markets. Achieving business success in long-term buyer-seller relationships is essential for both vegetable sellers and buyers. Thus understanding why and how some business relationships succeed while others fail is perhaps among the most important questions faced by the sellers and buyers. From a managerial perspective, it is then important to know how to improve overall chain performance. Based on this study, several main implications for management are pointed out.

First, *guanxi* networks play an important role in the way business is done in a buyer-seller relationship. The results of this study suggest that the sellers that increase their ability to comply with the buyer's quality and delivery requirements may substantially enhance their chances of success by establishing and maintaining *guanxi* networks. The sellers and buyers may check the adequacy of their existing *guanxi* networks and the type of benefits their *guanxi* networks might provide. *Guanxi* networks increase the access to modern high-value markets and the opportunities to maintain long-term relationships. So it is important for the vegetable companies to put effort into building *guanxi* networks to expand their markets and to develop their businesses. The sellers and buyers should then increase their face-to-face communication, the frequency of contacts and information sharing, and show honesty and sincerity to each partner in their *guanxi* networks. However, the case study showed that they should also be aware of the contingency of the costs to build and maintain such *guanxi* networks, because they might be locked in a network leading to the so-called overembeddedness effects (Uzzi, 1996). If the sellers or buyers either under or overestimate the negative/positive effects of *guanxi* networks, their efforts would be misguided and would eventually lead to the decrease of performance.

Second, vegetable smallholders in China can apply the results of this study to improve their performance. With the increasing output of relatively low-quality vegetables, farmers face serious problems in marketing their products, especially to emerging modern high-value market outlets such as processing companies, supermarkets and international markets. The exclusion of the smallholders from modern markets is becoming a hot debate in China. Case study and questionnaire survey analyses in this study showed that farmers' *guanxi* networks improve their access to modern markets characterised by high prices and long-term business relationships. Thus smallholders in China should use their *guanxi* networks to improve their integration into modern markets and to pursue good market performance.

Third, organisation is an efficient way to further extend *guanxi* networks for smallholders. Farmers can improve their negotiation power and have a better chance to achieve profit in situations of being organised, such as cooperatives and farmer associations (World Bank, 2001). Previous studies in China have indicated that organisations can facilitate small-scale farmers for a better market performance (Hu *et al.*, 2004; Shen *et al.*, 2005). Farmer professional associations (FPA) act as intermediary organisations to resolve the issue of efficiently aggregating vegetables over many small-scale farmers and the implementation of high quality and safety standards. These associations will be key to help farmers to enter into high-value market outlets. Besides cooperatives, farmer-volunteered or government-initiated FPA should also be energetically developed. As 'The Chinese Farmer Professional Cooperatives Law' was recently passed by the 10th National People's Congress of China and will become effective on July 1, 2007, organisation will certainly be further accelerated to organise the small farmers to perform as unified entities.

Fourth, this study revealed the importance of the vegetable sector and demonstrated ways to improve market performance for both smallholders and large-scale vegetable companies in China. Regarding the huge agricultural residence, cultivating high-value crops like fruit and vegetables is very important for China to further increase agricultural productivity, absorb labour surplus and increase farmers' incomes (Nyberg and Rozelle, 1999; Van Tongeren and Huang, 2004). *Guanxi* networks, buyer-seller relationships and organisations are important elements for vegetable producers (smallholders and large production companies), processing and exporting companies and retailers such as supermarkets to improve market performance. From a policy making perspective, improving infrastructure (internet access, transportation improvement and market construction) would enable farmers to have better access to market information and market facilities. Encouraging cooperation would allow smallholders to improve *guanxi* networks and enhance market power in the vegetable supply chains. Policy makers should also be aware that building a trusted society would improve the trustworthiness in business and in social life.



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# Appendices

## Appendix A Case study protocol

The major questions discussed in the interviews are listed below:

- Respondent information
  1. What's your function in the company?
  2. How long have you been working in this company?
  3. How long have you been working in this position?
- The company profile
  4. When did the company set up?
  5. How long has this company been in vegetable business?
  6. How many people are employed in your company?
- Market characteristics (buying and selling behaviour)
  7. Do you have preferred markets to purchase or sell vegetables?
  8. Where do you buy your vegetables?
  9. Where do you sell your products and how long have you been working in this market?
  10. What were the total sales and the sales for vegetables in particular of your company in 2001 and 2004, and what is your expectation for 2007?
  11. Which quality standards do you apply in your company (pollution-free food, green food, and organic food)?
  12. What is the percentage of each quality standard?
  13. Do you use contracts for your transactions, and if so, what kind of contracts?
- *Guanxi* network and buyer-seller relationships
  14. Does your *guanxi* network support your business?
  15. How did you build your *guanxi* network?
  16. How do you maintain your *guanxi* network?
  17. In which way does your *guanxi* network support your business?
  18. What are the major costs to start and maintain your *guanxi* network?
  19. Do you trust your partners? Does your *guanxi* network influence your trust?
  20. Do you have transactional specific investments? Did your *guanxi* network influence your investment behaviour?
- Market performance
  21. Are you satisfied with the vegetables you purchased? And are your customers satisfied?
  22. Did you under/over achieve the expected profitability with your vegetable purchasing and selling in the year 2004?

## **Appendix B Questionnaire for vegetable farmers**

#### *a. Personal characteristics*

<b>Sex</b>	<b>Age</b>	<b>What's the level of education:</b>	<b>Number of household members</b>	<b>Vegetable production experience</b>
1=male 2=female	years	1=primary school 2=middle school 3=high school 4=university level	persons	years

### *b. Resource endowments*

1. How much farmland do you own? \_\_\_(mu)
2. How much farmland do you use for vegetable production? \_\_\_(mu) or \_\_\_ (%)
3. How many vegetables do you harvest for the first season of this year? \_\_\_ (kg)
4. How many hours do you work to cultivate vegetables per day \_\_\_\_\_ (hours)

very bad    medium    very good

5. How do you evaluate your farmland quality for vegetable production? 1 2 3 4 5 6 7

6. How do you evaluate the techniques you use for vegetable production? 1 2 3 4 5 6 7

### c. Market characteristics

7. Would you please select your vegetable destination and write the development for each of them in terms of sales percentage for year 2001, 2004 and expected in 2007 respectively?

	2001	2004	expected in 2007
Wet market	_____ %	_____ %	_____ %
Wholesale market	_____ %	_____ %	_____ %
Supermarket	_____ %	_____ %	_____ %
Processing company	_____ %	_____ %	_____ %
Exporting company	_____ %	_____ %	_____ %
Other (specify)	_____ %	_____ %	_____ %
Total	100%	100%	100%

Please indicate your response to the following statements:

8. I am able to sell all of my vegetables                    1 2 3 4 5 6 7  
9. I prefer to sell vegetables to different markets            1 2 3 4 5 6 7



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Please select two of your most important vegetable markets \_\_\_ and \_\_\_ (wet market, wholesale market, supermarket, processing company, exporting company, etc.), then answer the following questions (If you only have one market, then the following questions are answered according to this market, no answer for 2<sup>nd</sup> market).

### e. Marketing activities

	1 <sup>st</sup> market	2 <sup>nd</sup> market
17. How far is this market away from your home?	_____ (km)	_____
18. How long does it take to reach this market?	_____ (minutes)	_____
19. What transportation vehicle do you use for this market (specify)	_____	_____
20. Considering the year 2004 equal to 100%, what is the development of your vegetable sales?		
	1 <sup>st</sup> market	2 <sup>nd</sup> market
2001	_____ %	_____ %
2004	100%	100%
expected in year 2007	_____ %	_____ %

### f. Guanxi network

We want to get an idea about the benefits of your guanxi network for your vegetable production and marketing. Please indicate your response to the following statements.

#### My guanxi network supports me:

	not true							totally	
	at all	1st market	2	3	4	5	6	7	2nd market
21. to find new buyers in this market	1	2	3	4	5	6	7	_____	
22. to get into new markets	1	2	3	4	5	6	7	_____	
23. to get payment more quickly	1	2	3	4	5	6	7	_____	
24. to improve my production technology	1	2	3	4	5	6	7	_____	
25. to order through telephone	1	2	3	4	5	6	7	_____	
26. to get credits from my buyers quickly	1	2	3	4	5	6	7	_____	
27. to get seeds or other inputs from my buyers	1	2	3	4	5	6	7	_____	

### g. Buyer-Seller Relationships

Please indicate your response regarding the following statements.

#### Transaction specific investments

	not true							totally	
	at all	1st market	2	3	4	5	6	7	2nd market
28. We have made large investments for vegetable production in the last three years	1	2	3	4	5	6	7	_____	
29. We have made a large investment for upgrading vegetable quality in the last three years	1	2	3	4	5	6	7	_____	

30. We have made significant investments to deliver products to this market	1	2	3	4	5	6	7	_____
31. If we switch to another market we would lose a lot of investments that we have made to sell to this market	1	2	3	4	5	6	7	_____
32. If we decided to stop working in this market, we would lose a lot of knowledge regarding the method of operation in this market	1	2	3	4	5	6	7	_____

<b>Trust</b>	not true		totally		2nd market			
	at all	1st market	true	_____				
33. The buyers I trade with have a good reputation	1	2	3	4	5	6	7	_____
34. I should not hesitate to make important selling decisions based on my buyers' suggestions	1	2	3	4	5	6	7	_____
35. My previous relationships with my buyers are satisfactory	1	2	3	4	5	6	7	_____
36. We expect the buyers to be working with us for a long time	1	2	3	4	5	6	7	_____
37. The buyers have been fair in their negotiations with us	1	2	3	4	5	6	7	_____
38. The buyers may act at our expense (D) <sup>40</sup>	1	2	3	4	5	6	7	_____
39. Based on experience, we can with complete confidence rely on the buyers to keep their promises to us	1	2	3	4	5	6	7	_____
40. The buyers are trustworthy	1	2	3	4	5	6	7	_____

#### *h. Governance and channel attributes*

<b>Governance attributes</b>	not true		totally		2nd market			
	at all	1st market	true	_____				
41. My transactions are based on written contracts (D)	1	2	3	4	5	6	7	_____
42. Price is pre-agreed with my buyers	1	2	3	4	5	6	7	_____
43. Quality is pre-agreed with my buyers	1	2	3	4	5	6	7	_____
44. Volumes are pre-agreed with my buyers	1	2	3	4	5	6	7	_____
45. Delivery time and place are pre-agreed with my buyers	1	2	3	4	5	6	7	_____

<sup>40</sup> This question was dropped from the model after factor analysis. We marked such questions with (D) in the questionnaires.

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<b>Channel attributes</b>	not true							totally true	2nd market
	at all	1st market	2	3	4	5	6		
46. Vegetable quality is important for this market	1	2	3	4	5	6	7		
47. Green A quality standard is required for this market	1	2	3	4	5	6	7		
48. Green AA and organic quality standards are required for this market	1	2	3	4	5	6	7		
49. Consistent delivery is important for this market	1	2	3	4	5	6	7		
50. Accurate delivery time and place are important for this market	1	2	3	4	5	6	7		
51. Value-added activities (such as washing, sorting, grading, etc.) are required for this market	1	2	3	4	5	6	7		
<i>i. Performance</i>									
	not true							totally true	2nd market
	at all	1st market	2	3	4	5	6		
52. My buyers are satisfied with the quality of my vegetables	1	2	3	4	5	6	7		
53. I am happy with the price I get from my buyers	1	2	3	4	5	6	7		
54. I get a good price for high quality vegetables from my buyers	1	2	3	4	5	6	7		
55. I sell my best quality vegetables to this market (D)	1	2	3	4	5	6	7		
56. It takes me less time to deliver vegetables to this market	1	2	3	4	5	6	7		
57. It takes me less time to sell vegetables in this market	1	2	3	4	5	6	7		
58. It costs me less when I sell vegetables to this market	1	2	3	4	5	6	7		
59. To what extent did you achieve the expected profitability with your vegetable selling to this market	1	2	3	4	5	6	7		



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Trader \_\_\_\_\_ (years)  
Vegetable company \_\_\_\_\_ (years)  
Other (specify) ( ) \_\_\_\_\_ (years)

Please indicate your response to the following statements regarding your vegetable source and the type of transaction agreement.

	not true at all	totally true
9. Our company is able to buy all the vegetables we needed	1 2 3 4 5 6 7	
10. We prefer to buy vegetables from different markets	1 2 3 4 5 6 7	
11. We prefer to buy vegetables from vegetable farmers directly	1 2 3 4 5 6 7	
12. We prefer to buy vegetables from vegetable wholesale market	1 2 3 4 5 6 7	
13. We prefer to buy vegetables using different transaction agreements	1 2 3 4 5 6 7	

Please select two of your most important vegetable suppliers: \_\_\_\_\_ and \_\_\_\_\_, (vegetable farmer, trader, vegetable company, etc.) then answer the following questions (If you only have one market, then the following questions are answered only according to this market).

Please indicate your response to the following statements.

market	1 <sup>st</sup> market	2 <sup>nd</sup>
14. How far is this supplier away from your company?	_____ (km)	_____
15. How long does it take to reach this supplier?	_____ (minutes)	_____
16. Do you have cooling transportation vehicles to transport vegetables from this supplier? (yes/no)	_____	_____
17. Consider the year of 2004 equal to 100%, what is the development of purchasing?	1 <sup>st</sup> market	2 <sup>nd</sup> market
-2001	_____ %	_____ %
-2004	100%	100%
-Expected in 2007	_____ %	_____ %

### c. Guanxi networks

We want to get an idea about the benefits of *guanxi* network for your vegetable business.

Please indicate your response to the following statements.

**My *guanxi* network supports me:**

	not true							totally	
	at all	1st market	true			2nd market			
18. to find new suppliers from this market	1	2	3	4	5	6	7		-----
19. to get into new supplier market	1	2	3	4	5	6	7		-----
20. to face less conflicts regarding payment	1	2	3	4	5	6	7		-----
21. to order through telephone with our suppliers	1	2	3	4	5	6	7		-----
22. to offer credits to our suppliers	1	2	3	4	5	6	7		-----
23. to offer seeds or other inputs to our suppliers	1	2	3	4	5	6	7		-----

*d. Buyer-supplier relationships*

Please indicate your response to the following statements.

**Transaction specific investments**

	not true							totally	
	at all	1st market	true			2nd market			
24. We have made large investments for vegetable procurement in the last three years	1	2	3	4	5	6	7		-----
25. We have made a large investment for vegetable quality control in the last three years	1	2	3	4	5	6	7		-----
26. If we switch to another market we would lose a lot of investments that we have made to purchase from this market	1	2	3	4	5	6	7		-----
27. If we decided to stop working in this market, we would waste a lot of knowledge regarding the method of operation in this market	1	2	3	4	5	6	7		-----

**Trust**

	not true							totally	
	at all	1st market	true			2nd market			
28. The suppliers we trade with in this market have a good reputation	1	2	3	4	5	6	7		-----
29. We should not hesitate to make important purchasing decisions based on our suppliers' suggestions	1	2	3	4	5	6	7		-----
30. Our previous relationships with our suppliers are satisfactory	1	2	3	4	5	6	7		-----
31. We expect the suppliers to be working with us for a long time	1	2	3	4	5	6	7		-----
32. The suppliers have been fair in their negotiations with us	1	2	3	4	5	6	7		-----
33. The suppliers may act at our expense (D)	1	2	3	4	5	6	7		-----
34. Based on our experience, we can with complete confidence rely on the suppliers to keep their	1	2	3	4	5	6	7		-----

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promises to us	1	2	3	4	5	6	7	-----
35. The suppliers are trustworthy	1	2	3	4	5	6	7	-----

### e. Governance and channel attributes

<b>Governance attributes</b>	not true		totally		2nd market			
	at all	Ist market	true					
36. Our transactions are based on written contracts (D)	1	2	3	4	5	6	7	-----
37. Price is pre-agreed with our suppliers (D)	1	2	3	4	5	6	7	-----
38. Quality is pre-agreed with our suppliers (D)	1	2	3	4	5	6	7	-----
39. Transaction volumes are pre-agreed with our suppliers	1	2	3	4	5	6	7	-----
40. Delivery time and places are pre-agreed with our suppliers	1	2	3	4	5	6	7	-----

<b>Channel attributes</b>	not true		totally		2nd market			
	at all	Ist market	true					
41. Vegetable quality is reliable at this market	1	2	3	4	5	6	7	-----
42. This supplier delivers vegetables in Green A quality standard	1	2	3	4	5	6	7	-----
43. This supplier delivers vegetables in Green AA and organic quality standards	1	2	3	4	5	6	7	-----
44. This supplier delivers consistent quality vegetables	1	2	3	4	5	6	7	-----
45. This supplier has accurate delivery time and delivery place	1	2	3	4	5	6	7	-----
46. This supplier offers value-added activities (washing, sorting, grading etc.) (D)	1	2	3	4	5	6	7	-----

### f. Performance

	not true		totally		2nd market			
	at all	Ist market	true					
47. We are satisfied with the quality of vegetables (D)	1	2	3	4	5	6	7	-----
48. We are happy with the price we pay to our suppliers	1	2	3	4	5	6	7	-----
49. We pay a good price for high quality vegetables	1	2	3	4	5	6	7	-----
50. We get best quality vegetables from this market (D)	1	2	3	4	5	6	7	-----
51. It costs us less when we purchase vegetables from this market	1	2	3	4	5	6	7	-----
52. It takes us less time to finish an order in this market	1	2	3	4	5	6	7	-----

## Part II: Downstream Partnerships

### g. Marketing activities

53. Following are the possible destinations for your fresh vegetables. Please select the one(s) you sell your vegetables to and write down the percentage for year 2001, 2004 and expected in year 2007?

	2001	2004	expected in 2007
Retailer	_____ %	_____ %	_____ %
Supermarket	_____ %	_____ %	_____ %
Exporter	_____ %	_____ %	_____ %
International market	_____ %	_____ %	_____ %
Others (specify) _____	_____ %	_____ %	_____ %
Total	100%	100%	100%

54. How long have you been selling vegetable products to the following markets?

Retailer	_____ (years)
Supermarket	_____ (years)
Exporter	_____ (years)
International buyer	_____ (years)
Others (specify) ( ) _____ (years)	_____ (years)

Please indicate your response to the following statements regarding your vegetable destination and the type of transaction agreement.

	not true at all	totally true
55. Our company is able to sell all the vegetables we have	1 2 3 4 5 6 7	
56. We prefer to sell vegetables to one market only	1 2 3 4 5 6 7	
57. We prefer to sell vegetables to different markets	1 2 3 4 5 6 7	
58. We prefer to sell vegetables using a single agreement	1 2 3 4 5 6 7	

Please select two of your most important vegetable markets \_\_\_\_\_ and \_\_\_\_\_ (retailer, supermarket, exporter, international market etc.), then answer the following questions (If you only have one market, then the following questions are answered only according to this market).

	1 <sup>st</sup> market	2 <sup>nd</sup> market
59. How far is the buyer away from your company?	_____ (km)	_____
60. How long does it take to reach your buyer?	_____ (minutes)	_____
61. Do you have cooling transportation vehicles for vegetable transportation to this market? (yes/no)	_____	_____

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62. Consider the year of 2004 equal to 100%, what is the development of selling?

	1 <sup>st</sup> market	2 <sup>nd</sup> market
-2001	_____ %	_____ %
-2004	100%	100%
-Expected in 2007	_____ %	_____ %

### h. Guanxi networks

We want to get an idea about the benefits of your *guanxi* networks for your vegetable selling activities. Please indicate your response to the following statements.

<b>My guanxi network with buyers supports me:</b> not true	at all	1st market	true	totally	2nd market			
63. to find new buyers in this market	1	2	3	4	5	6	7	_____
64. to get into new buyer market	1	2	3	4	5	6	7	_____
65. to face less conflicts regarding payment	1	2	3	4	5	6	7	_____
66. to accept telephone order with our buyers	1	2	3	4	5	6	7	_____
67. to get credits from our buyers	1	2	3	4	5	6	7	_____

### i. Buyer-supplier relationships

Please indicate your response to the following statements.

<b>Transaction specific investments</b>	not true	at all	1st market	true	totally	2nd market		
68. We have made large investments for vegetable sale in the last three years	1	2	3	4	5	6	7	_____
69. We have made a large investment for vegetable quality control in the last three years	1	2	3	4	5	6	7	_____
70. If we switch to another market we would lose a lot of investments that we have made to sell to this market	1	2	3	4	5	6	7	_____
71. If we decided to stop working in this market, we would waste a lot of knowledge regarding the method of operation in this market	1	2	3	4	5	6	7	_____

<b>Trust</b>	not true	at all	1st market	true	totally	2nd market		
72. The buyers we trade with have a good reputation	1	2	3	4	5	6	7	_____
73. We should not hesitate to make important sale decisions based on our buyers' suggestions	1	2	3	4	5	6	7	_____
74. Our previous relationships with our buyers are satisfactory	1	2	3	4	5	6	7	_____

75. We expect the buyers to be working with us for a long time	1	2	3	4	5	6	7	-----
76. The buyers have been fair in their negotiations with us	1	2	3	4	5	6	7	-----
77. The buyers may act at our expense (D)	1	2	3	4	5	6	7	-----
78. Based on our experience, we can with complete confidence rely on the buyers to keep their promises to us	1	2	3	4	5	6	7	-----
79. The buyers are trustworthy	1	2	3	4	5	6	7	-----

*j. Governance and channel attributes*

<b>Governance attributes</b>	not true		totally		2nd market			
	at all	1st market	true	-----				
80. Our transactions are based on written contracts	1	2	3	4	5	6	7	-----
81. Price is pre-agreed with our buyers	1	2	3	4	5	6	7	-----
82. Quality is pre-agreed with our buyers	1	2	3	4	5	6	7	-----
83. Transaction volumes are pre-agreed with our buyers	1	2	3	4	5	6	7	-----
84. Delivery time and place are pre-agreed with our buyers	1	2	3	4	5	6	7	-----

<b>Channel attributes</b>	not true		totally		2nd market			
	at all	1st market	true	-----				
85. Vegetable quality is reliable in this market (D)	1	2	3	4	5	6	7	-----
86. This market requires vegetables in Green A quality standard	1	2	3	4	5	6	7	-----
87. This market requires vegetables in Green AA and organic quality standards	1	2	3	4	5	6	7	-----
88. This market requires consistent quality vegetables	1	2	3	4	5	6	7	-----
89. This market has accurate delivery time and delivery place	1	2	3	4	5	6	7	-----
90. This market requires value-added activities (washing, sorting, grading etc.)	1	2	3	4	5	6	7	-----

*k. Performance*

	not true		totally		2nd market			
	at all	1st market	true	-----				
91. Our buyers are satisfied with the quality of vegetables from our company	1	2	3	4	5	6	7	-----
92. We are happy with the price we get from our buyers	1	2	3	4	5	6	7	-----
93. We get a good price for high quality vegetables (D)	1	2	3	4	5	6	7	-----

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94. We sell best quality vegetables to this market (D) 1 2 3 4 5 6 7 -----

95. It costs us less when we sell vegetables to this market 1 2 3 4 5 6 7 -----

96. It takes us less time to finish an order in this market 1 2 3 4 5 6 7 -----

## Appendix D Discriminant validity test

### Part I Correlations of the constructs

#### 1: Correlations of the constructs for the farmer sample (n=167)

	1	2	3	4	5
1. Transaction specific investments	<b>0.874</b>				
2. Interpersonal trust	0.525	<b>0.762</b>			
3. Quality requirements compliance	0.091	0.154	<b>0.756</b>		
4. Quality/price satisfaction	0.376	0.459	-0.182	<b>0.769</b>	
5. Efficiency	0.582	0.278	-0.005	0.085	<b>0.884</b>

#### 2: Correlations of the constructs for the buyer sample: upstream partnerships (n=84)

	1	2	3	4	5
1. Transaction specific investments	<b>0.789</b>				
2. Interpersonal trust	0.218	<b>0.760</b>			
3. Quality requirements compliance	-0.280	0.269	<b>0.739</b>		
4. Price satisfaction	0.069	0.652	-0.388	<b>0.776</b>	
5. Efficiency	0.150	0.181	0.126	-0.251	<b>0.964</b>

#### 3: Correlations of the constructs for the buyer sample: downstream partnerships (n=92)

	1	2	3	4	5
1. Transaction specific investments	<b>0.822</b>				
2. Interpersonal trust	0.106	<b>0.723</b>			
3. Quality requirements compliance	-0.195	0.110	<b>0.838</b>		
4. Quality/price satisfaction	0.198	0.489	-0.055	<b>0.878</b>	
5. Efficiency	0.120	0.111	0.105	-0.013	<b>0.921</b>

Note: The bold numbers on the diagonal are the square root of the variance shared between the constructs and their measures (square root of AVE). Lower triangle elements are the correlations among the constructs.

## Part II Loading and cross loadings matrix

To make these tables easy to read, we omit the correlations below 0.5.

**4: Loadings and cross loadings for the farmer sample (n=167)**

<b>Constructs</b>	<b>Items*</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1. Transaction specific investments	B28	<b>0.920</b>				
	B29		<b>0.924</b>			
	B30			<b>0.900</b>		
	B31				<b>0.842</b>	
	B32					<b>0.806</b>
2. Interpersonal Trust	B33			<b>0.717</b>		
	B34				<b>0.729</b>	
	B35					<b>0.732</b>
	B36					<b>0.774</b>
	B37					<b>0.764</b>
	B39					<b>0.797</b>
	B40				<b>0.847</b>	0.523
3. Quality requirements compliance	B46				<b>0.884</b>	
	B47					<b>0.699</b>
	B48					<b>0.883</b>
4. Quality/price satisfaction	B52	0.528				<b>0.778</b>
	B53					<b>0.880</b>
	B54					<b>0.647</b>
5. Efficiency	B56					<b>0.826</b>
	B57		0.555			<b>0.915</b>
	B58			0.577		<b>0.924</b>

\*: B28 refers to the 28<sup>th</sup> question in Appendix B.

**5: Loadings and cross loadings for the buyer sample: upstream partnerships (n=84)**

<b>Constructs</b>	<b>Items**</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1. Transaction specific investments	C24	<b>0.723</b>				
	C25		<b>0.837</b>			
	C26			<b>0.863</b>		
	C27				<b>0.717</b>	
2. Interpersonal trust	C28			<b>0.780</b>		
	C29				<b>0.786</b>	
	C30			<b>0.696</b>		
	C31				<b>0.706</b>	
	C32			<b>0.733</b>		
	C34				<b>0.754</b>	
	C35					<b>0.856</b>
3. Quality requirements compliance	C41	0.619			<b>0.826</b>	
	C42			<b>0.684</b>		
	C43				<b>0.699</b>	
4. Price satisfaction	C48				<b>0.737</b>	
	C49					<b>0.815</b>
5. Efficiency	C51					<b>0.872</b>
	C52					<b>0.985</b>

\*\*: C24 refers to the 24<sup>th</sup> question in Appendix C.

**6: Loadings and cross loadings for the buyer sample: downstream partnerships (n=92)**

<b>Constructs</b>	<b>Items</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1. Transaction specific investments	C68	<b>0.843</b>				
	C69		<b>0.837</b>			
	C70			<b>0.900</b>		
	C71				<b>0.693</b>	
2. Interpersonal trust	C72			<b>0.757</b>		
	C73				<b>0.634</b>	
	C74					<b>0.739</b>
	C75				<b>0.716</b>	
	C76				<b>0.680</b>	
	C78				<b>0.747</b>	
	C79					<b>0.780</b>
3. Quality requirements compliance	C86				<b>0.691</b>	
	C87					<b>0.964</b>
4. Quality/price satisfaction	C91					<b>0.848</b>
	C92					<b>0.908</b>
5. Efficiency	C95					<b>0.913</b>
	C96					<b>0.951</b>

## Appendix E Factors determining marketing channel choice

### 1. Factors explaining vegetable farmers' marketing channel choice

Independent variables	Field traders	Wholesale markets	Processing companies
Support from guanxi networks (factor score)	-0.29 (0.50)	-0.45 (0.39)	-1.12 (0.67)*
Transaction specific investments (factor score)	-0.74 (0.46)	-1.03 (0.41)**	-0.04 (0.43)
Interpersonal trust (factor score)	2.75 (0.54)***	1.83 (0.37)***	1.32 (0.53)***
Compliance with delivery requirements (factor score)	-0.56 (0.41)	0.08 (0.34)	-0.17 (0.46)
Sex of the interviewee (1=male, 0=female)	2.10 (0.68)***	0.66 (0.57)	0.40 (0.85)
Education level of the interviewee (0,1,2,3)	-0.86 (0.38)**	0.15 (0.29)	-0.64 (0.38)*
Vegetable experience of the interviewee (years)	-0.06 (0.03)***	-0.001 (0.02)	0.02 (0.05)
Total farmland of the interviewee (ha)	4.41 (2.29)*	8.73 (2.14)***	4.39 (2.59)*
Own high-value vehicles (1=yes)	1.40 (0.93)	0.81 (0.82)	4.99 (1.37)***
Perceived risk (1-5 Likert scale, reversed variable)	-0.16 (0.49)*	1.25 (0.70)*	1.74 (1.24)
Constant	0.12 (2.23)	-8.17 (3.28)***	-12.78 (5.94)***

The reference channel is sales at wet markets.

Log Pesudo Likelihood = -127.12;  $p < 0.01$ ; Pesudo  $R^2 = 0.42$

Notes: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.10$ .

Sample size: 167

**2. Factors explaining vegetable processing and exporting companies' marketing channel choice in purchasing vegetables (binary logit analysis)**

<b>Independent variables</b>	<b>Farmers</b>	<b>Traders</b>	<b>Domestic food companies</b>
Support from <i>guanxi</i> networks (factor score)	-0.40 (0.28)	1.34 (0.54)***	-0.99 (0.35)***
Transaction specific investments (factor score)	0.20 (0.26)	-0.51 (0.38)	-0.27 (0.29)
Interpersonal trust (factor score)	0.26 (0.43)	0.02 (0.67)	1.38 (0.72)***
Compliance with delivery requirements (factor score)	-0.42 (0.45)	-1.22 (0.79)	-0.18 (0.69)
Efficiency (factor score)	-0.51 (0.35)	0.67 (0.51)	2.14 (0.87)***
Vegetable business experience (years)	0.07 (0.07)	-0.17 (0.12)	-0.12 (0.11)
Vegetable specialisation (%)	0.04 (0.01)***	-0.004 (0.02)	n.a.
Total sales	-0.39 (0.28)	0.99 (0.63)	0.04 (0.48)
Constant	-1.06 (1.65)	-6.21 (3.27)	-3.03 (1.74)
Log Pseudo likelihood	-35.37	-18.14	-18.95
Pseudo R <sup>2</sup>	0.28***	0.25***	0.38***

Notes: \*\*\*:  $p<0.01$ , \*\*:  $p<0.05$ .

Sample size: 84

### 3. Factors explaining vegetable processing and exporting companies' marketing channel choice in selling vegetables (binary logit analysis)

Independent variables	International markets	Domestic food companies	Domestic wholesale markets	Domestic supermarkets	Domestic market consumers
Support from guanxi networks (factor score)	-0.34 (0.37)	1.24 (0.39)***	0.63 (0.46)	-0.05 (0.70)	-0.73 (0.36)***
Transaction specific investments (factor score)	-0.16 (0.30)	0.18 (0.28)	-0.62 (0.32)***	-0.54 (0.40)	1.18 (0.62)*
Interpersonal trust (factor score)	0.84 (0.42)***	-1.13 (0.61)*	0.12 (0.55)	0.52 (0.59)	-0.32 (0.45)
Compliance with delivery requirements (factor score)	1.16 (0.45)***	0.16 (0.46)	-1.63 (0.85)***	2.67 (1.06)***	-0.81 (0.42)***
Efficiency (factor score)	-0.19 (0.32)	0.12 (0.34)	0.85 (0.48)*	-0.29 (0.49)	-0.27 (0.40)
Vegetable business experience (years)	0.18 (0.06)***	-0.31 (0.13)***	-0.13 (0.06)***	-0.25 (0.12)***	0.02 (0.03)
Total sales	0.64 (0.35)*	0.01 (0.002)***	-0.13 (0.56)	0.19 (0.61)	-0.70 (0.36)***
Vegetable specialisation (%)	-0.001 (0.01)	0.02 (0.02)	0.02 (0.02)	n.a.	-0.02 (0.01)
Pollution-free vegetable dummy	0.22 (0.68)	-0.42 (0.82)	-0.87 (1.27)	0.78 (0.79)	0.58 (1.23)
Perceived risk (5 Likert scale)	-0.79 (0.74)	-1.07 (0.67)	1.72 (1.11)*	0.14 (0.94)	n.a.
Constant	-0.84 (4.38)	2.25 (4.25)	-11.68 (4.72)***	-4.93 (4.33)	1.21 (2.88)
Log Pseudo likelihood	-39.38	-31.34	-18.10	-16.61	-23.29
Pseudo R <sup>2</sup>	0.38***	0.26***	0.39***	0.33***	0.45***

Notes: \*\*\*:  $p<0.01$ , \*\*:  $p<0.05$ ; \*:  $p<0.10$ .

Sample size: 92



# Summary

The sheer size of China's economy, its rapid growth and its increasing integration into the global economy will make China a crucial player in the world agricultural market in the years to come. China is already the most important vegetable producer in the world, contributing to one-third of the world's vegetable production. In the last 20 years, vegetable production in China has become a way to improve agricultural productivity, raise farm household income and absorb agricultural labour surplus. In 2005, China cultivated 17.7 million hectares of vegetables with a total output of 565 million tons. Vegetable production in China is not only aimed towards domestic markets, but also exported to international markets. Vegetable export further enhances the position of Chinese vegetable sector. For the last five years, the average annual growth rate of vegetable export was over 16%.

## Research questions

Chinese vegetable sector also faces several problems. First, the enlargement of the production scale leads to the over-supply of low-quality vegetables to market. This surplus has to be sold for dump prices, which consequently leads to the investment problems in vegetable production as well as in marketing activities. Second, vegetable quality and safety become the major constraints for the further development of Chinese vegetable sector. The high quality standards prove to be difficult to be implemented by smallholders due to technical, managerial and financial constraints. Third, only a small portion of China's vegetables is exported, and the market share of new forms of domestic market outlets (e.g. supermarkets) is also rather small. Vegetables that are sold in high-value market outlets mostly come from selected production areas and organised producers. Most of vegetable smallholders are excluded from these advanced market outlets due to quality and delivery problems. Fourth, the competitiveness of Chinese vegetables is largely based on low prices. The objective of this study is to identify the best governance mechanisms to support market performance in Chinese vegetable supply chains. To fulfil this objective, this study addresses the following central research question:

*What is the best way to organise vegetable supply chains taking into account the fast socio-economic developments in China?*

In a Confucian society like China, personal relationships, called *guanxi*, prevail in social life and business society. *Guanxi* functions as informal governance in China. People rely on *guanxi* to seek valuable information, receive assistance and facilitate business transactions. Therefore, the objective of this study is also to understand how Chinese *guanxi* influences the integration of buyer-seller relationships, focusing on interpersonal trust, transactions specific investments and contractual governance, and if, and if so, how integrated buyer-seller relationships influence market performance. We investigate the role of *guanxi*, as a Chinese

form of social capital, for entering of smallholders and processors in domestic and, even more important, high-value supermarkets and international market outlets. This central research question is investigated by addressing the following two research questions:

1. *Do guanxi networks improve the integration of buyer-seller relationships and ultimately, market performance in vegetable supply chains in China?*

2. *Is there any difference in the use and the effect of guanxi networks in upstream and downstream buyer-seller relationships, and traditional and modern high-value market outlets?*

## Data, research model and methodology

We applied various theoretical approaches (supply chain management, social capital theory, and transaction cost economics) and developed an integrated research framework (see Figure 1) to analyse vegetable supply chains in China. We combined case study with survey approach and applied structural equation modelling to answer the research questions. Primary data were collected from two key groups of participants in vegetable supply chains in Jiangsu Province, consisting of 167 vegetable producers (farmers) and 84 buyers (vegetable processing companies, exporting companies and supermarkets). The survey was conducted between January 2004 and October 2005. We identified three buyer-seller relationships: two relationships with downstream partners (vegetable farmers with their buyers and these buyers with their final customers) and one relationship with upstream partners (vegetable buyers with farmers).

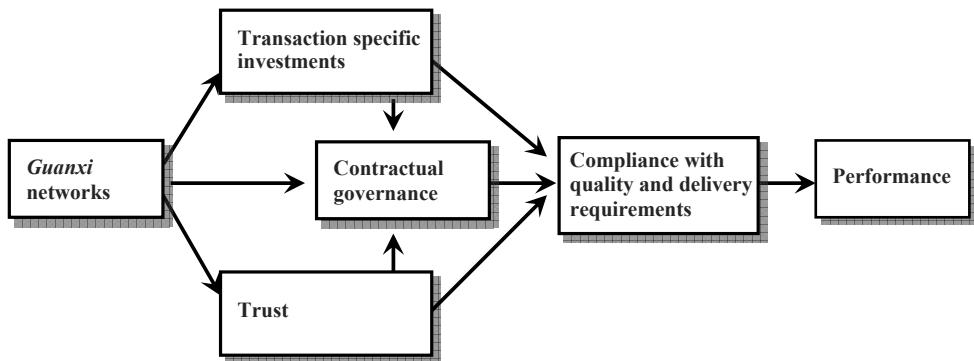
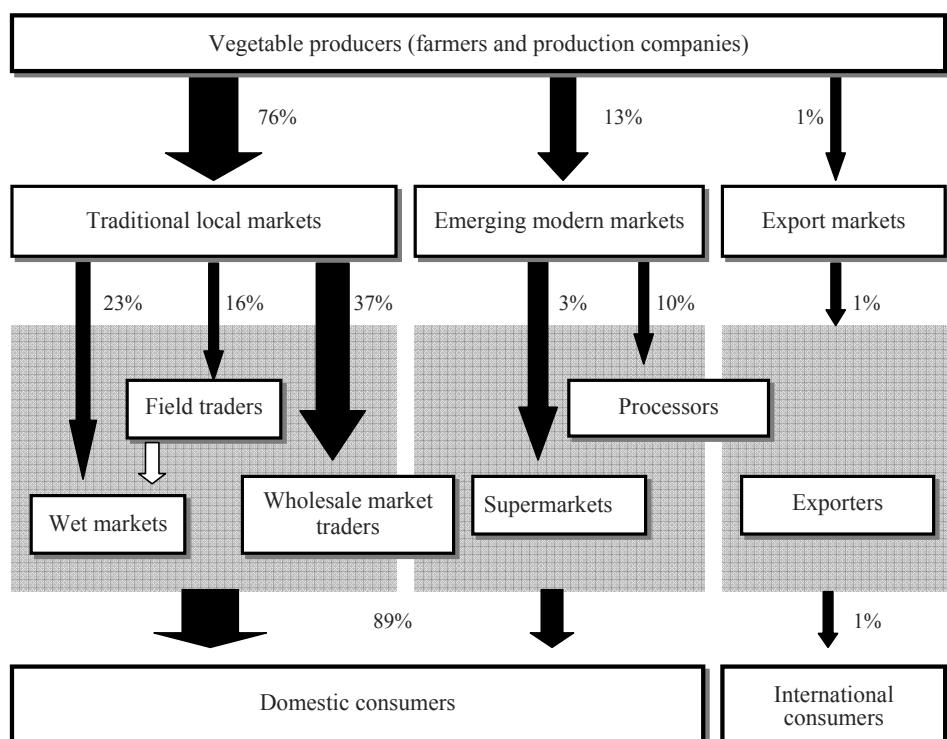


Figure 1. Conceptual research model.

## Vegetable production and marketing in China

Background analysis of the Chinese vegetable sector indicates that vegetable production and marketing in China in general and in Jiangsu Province in particular is smallholder based and shows a low organisational level. Only organised farmers and some processing and exporting companies are able to sell their vegetables to high-value market outlets like supermarkets and international markets. Currently, traditional market outlets, like wet markets and wholesale markets, still prevail. More than three quarters of the vegetables in Jiangsu Province are sold to these markets. Only about 1% of the vegetables are sold to international markets, and less than 3% are sold to supermarkets, the rest of 10% are wasted during the circulations (see Figure 2). Recently a clear shortening of the supply chains can be observed. Processors are increasingly moving away from selling vegetables through intermediate companies to selling directly to supermarkets and international markets. In the meantime, processors and exporters/supermarkets are increasingly shifting away from buying vegetables through traders to buying from producers directly (individual farmers or specialised production bases).



→ Arrows indicate vegetable flows. Numbers indicate the share of vegetables distributed through different channels.

Figure 2. Vegetable distribution networks in Jiangsu Province, China.

## **Conclusions and discussions**

This study shows that *guanxi* networks have strong direct and indirect impacts on buyer-seller relationships (focusing on interpersonal trust, transaction specific investments and contractual governance). Both vegetable sellers and buyers recognise the supportive effects of *guanxi* networks on vegetable transactions in terms of information sharing, technical and financial assistance, and transaction facilitation. Interestingly, the indicated supportive effects of *guanxi* networks are significantly stronger in relationships with downstream partners than in relationships with upstream partners, because the sellers and buyers use their *guanxi* differently in purchasing and selling activities. Small-scale primary producers use their *guanxi* networks to find buyers and to get access to new markets. Processing and exporting companies rely on their *guanxi* networks to expand business and maintain long-term relationships. However, processing and exporting companies tend to use less *guanxi* in relationships with upstream partners since there is little risk in purchasing required vegetables in a buyer dominated market. Furthermore, *guanxi* turns out to be as important in traditional domestic markets (such as the wet markets and wholesale markets) as in modern high-value supermarkets and international market outlets. As suggested by previous business literature, case study and survey analysis of this study indicate that *guanxi* networks enrich the business opportunities and enhance buyer-seller relationships in international markets. This is because processors and exporters with international connections (*guanxi*) are more likely to exploit international market opportunities than those who lack such connections.

Formal and informal governance mechanisms are both important in achieving good performance in the vegetable sector in Jiangsu Province. Formal contract-based transactions improve market performance via complying with delivery requirements. This is because delivery requirements are clearly defined in formal contracts. Informal *guanxi*-based personal relationships are important to reduce transaction costs and safeguard transactions in an efficient manner. This study indicates a complementary effect between relational (*guanxi*) and formal (contracts) governance, implying that *guanxi* will prevail in Chinese business and will co-exist with formal systems. The combination of formal and informal governance mechanisms, therefore, seems to be the best way to organise vegetable supply chains in China.

We also find that integrated buyer-seller relationships positively contribute to market performance. Interpersonal trust and contractual governance are the most important factors in achieving good market performance for all chain participants, because they improve the compliance with delivery requirements. Quality/price satisfaction is perceived as the most important performance attribute in relationships with downstream partners; while price satisfaction is emphasised in relationships with upstream partners. Quality is the right 'brick' to knock on the 'door' of international markets. Furthermore, in order to achieve a good performance, reducing transaction costs in procurement processes is sound.

## Distinctive paths to achieve market performance

In the structural model, the sellers and buyers follow distinctive paths to achieve market performance (Figure 3 and 4). In relationships with downstream partners, both producers and processors and exporters/supermarkets perceive *guanxi* networks and contractual governance as important mechanisms to achieve market performance (Figure 3).

Vegetable producers rely on their *guanxi* networks to maintain good contacts with trusted buyers. Interestingly, managers in processing and exporting companies also rely on their *guanxi* networks to get access to high-value supermarkets and international markets and maintain long-term business relationships. Efficiency, quality/price satisfaction and ultimately, profitability are improved when they are able to comply with delivery requirements. The compliance level is further improved by trusted buyer-seller relationships and support from *guanxi* networks. Furthermore, interpersonal trust indirectly improves the compliance with delivery requirements through the mediator variable of contractual governance.

In relationships with upstream partners, however, vegetable buyers (processing and exporting companies and supermarkets) take a different path to achieve market performance (see Figure 4).

Vegetable buyers are able to see what they buy in face-to-face contacts at the market place. In a highly buyer dominated market, buyers face little risk in acquiring required vegetables and possess strong negotiation power. Therefore, it is apparently not necessary for them to depend on social networks and *guanxi*. However, sharing information with trusted partners is a way to improve compliance with buyer's requirements and ultimately, to achieve good market performance. In this case, *guanxi* networks and formal contracts play a less important role.

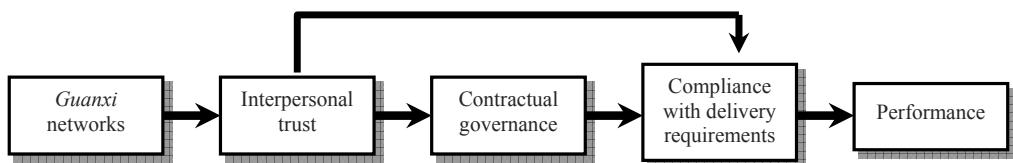


Figure 3. Path to achieve performance in relationships with downstream partners.

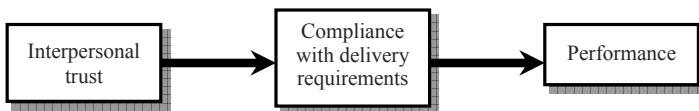


Figure 4. Path to achieve performance in relationships with upstream partners.

This study complements the emphasis of transaction cost economics on transaction specific investments with relational governance and trust. Moreover, in line with social capital theory, this study emphasises the importance of business networks in improving the level of trust, and highlights the support from *guanxi* networks functioning as a mechanism for safeguarding investments and collaboration. This study stresses the complementary effects of relational (*guanxi*) and formal (contracts) governance mechanisms on market performance. Furthermore, typical supply chain management aspects, such as quality and delivery compliance, should be included in the model to explain buyer-seller relationships in vegetable supply chains in China.

### **Managerial implications**

The implications of this study are best viewed within the context of the trend towards close, long-term buyer-seller relationships on the one hand, and cultivation of personal relationships in business practices on the other. *Guanxi* networks are especially beneficial for vegetable producers, processors and exporters/supermarkets in their downstream relationships. But they should be aware of the costs to build and maintain such *guanxi* networks and avoid overembeddedness. Case studies and interviews during the fieldwork demonstrated that farmer cooperatives and associations can act as intermediaries to solve the dilemma of small-scale production versus big market and to improve the implementation of high-quality standards by small-scale producers. These organisations are key in helping farmers to be integrated into supermarkets and international markets, and therefore should be energetically developed.

Business is like a battlefield; if you cannot succeed, you lose. Using your *guanxi* networks in the right manner allows you to achieve your goals. As the Chinese ancient *Sun Tzu's The Art of War* told us, 'Know yourself, know your enemy, and you can fight a hundred battles with no danger of defeat'.

# Samenvatting (Summary in Dutch)

China is in toenemende mate een belangrijke speler in de wereldhandel van agrarische producten door de snel expanderende Chinese economie en de groeiende integratie in de wereldmarkt. China is met een bijdrage van eenderde aan de wereldwijde productie de grootste producent van groente in de wereld. Over de afgelopen 20 jaar heeft in China zelf de productie van groente in belangrijke mate bijgedragen aan verbetering van de agrarische productiviteit en het inkomen van de boeren, alsmede het nuttig aanwenden van het arbeidsoverschot in de landbouw. In 2005 werd in China 17,7 miljoen hectare groente verbouwd met een totale opbrengst van 565 miljoen ton. De afzet is in toenemende mate gericht op de internationale markt door export van groente naar andere landen: over de afgelopen vijf jaar groeide de export met 16% per jaar. Deze trend zal de positie van China op de wereldmarkt verder versterken.

## Onderzoeksvragen

Ondanks de geschatte voorspoed, wordt de Chinese groentesector ook gekenmerkt door een aantal belangrijke problemen. Ten eerste, de schaalvergrotting in de productie heeft geleid tot overproductie van groente met een gebrekkige kwaliteit. Dit productieoverschot wordt tegen dumpprijzen verkocht, waardoor investeringen en marketing activiteiten in de groentesector in gevaar komen. Ten tweede, door de groeiende vraag naar waarborging van de voedselkwaliteit en -veiligheid, staat de Chinese groentesector onder druk: de kleinschalig producerende boeren hebben grote moeite met het implementeren van kwaliteitsstandaarden door gebrek aan technische ondersteuning, management ervaring en financiële middelen. Ten derde, de meeste kleinschalige producenten worden uitgesloten van deelneming in exportmarkten en hoogwaardige nationale markten (zoals verkoop in supermarkten). Dit heeft te maken met een gebrek aan kwaliteit, maar ook logistieke problemen met het transporteren van de groente. Ten vierde, de concurrentiekraft van de Chinese groenteproductie is gebaseerd op lage kosten productie terwijl kwaliteit op moderne markten de eerste vereiste is. Het doel van dit onderzoek is om meer inzicht te verkrijgen in de beste manier, in termen van marktprestatie, waarop de toeleveringsketens van groente in China georganiseerd kunnen worden. Om dit doel te bereiken, is de volgende hoofdonderzoeksvraag van belang.

*Wat is de beste manier waarop toeleveringsketens van groente in China georganiseerd kunnen worden rekening houdende met de sociaal-economische ontwikkelingen in China?*

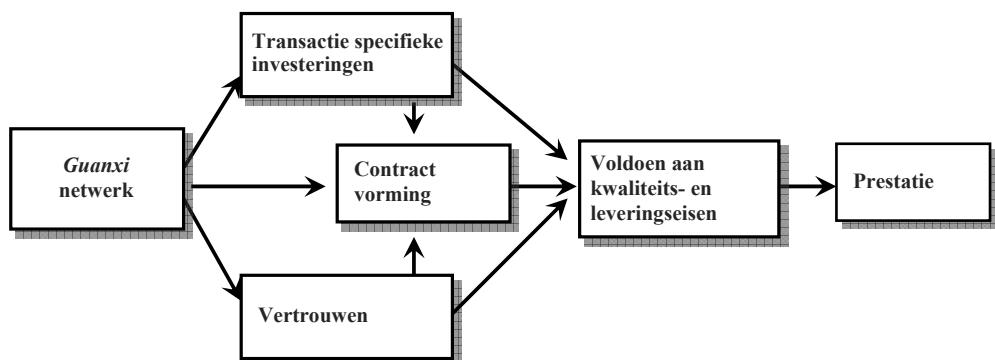
In een Confuciaanse maatschappij, zoals China, spelen persoonlijke relaties, ofwel *guanxi*, een belangrijke rol in zowel de sociale als zakelijke omgang. *Guanxi* is belangrijk voor het vinden van waardevolle informatie, het verkrijgen van ondersteuning in de persoonlijke sfeer, maar ook voor het onderhouden van zakelijke relaties. Het doel van dit onderzoek is om de invloed van *guanxi* op de integratie van koper-verkoper relaties te bepalen en hoe deze integratie de

marktprestatie beïnvloeden. M.b.t. integratie van koper-verkoper relaties wordt in het bijzonder aandacht besteed aan de rol van vertrouwen in persoonlijke relaties, transactie specifieke investeringen en contractgestuurde relaties *Guanxi* zal daarbij geïnterpreteerd worden als een vorm van sociaal kapitaal dat typisch is voor China en belangrijk voor kleine producenten en verwerkers van groente voor het betreden van de nationale markt en, nog belangrijker, het vinden van afzetmogelijkheden aan hoogwaardige supermarkten en de internationale markt. De centrale onderzoeksfrage is onderverdeeld in de volgende twee subvragen.

1. *Dragen guanxi netwerken bij aan de integratie van de koper-verkoper relaties en, op basis daarvan, de marktprestatie in de toeleveringsketens van groente in China?*
2. *Is er een verschil in het gebruik van guanxi netwerken tussen de betrokken partijen in de koper-verkoper relaties (stroomopwaarts en -afwaarts in de toeleveringsketen), alsmede tussen de traditionele en moderne hoogwaardige marktafzetmogelijkheden?*

## Data, onderzoeksmodel en methodologie

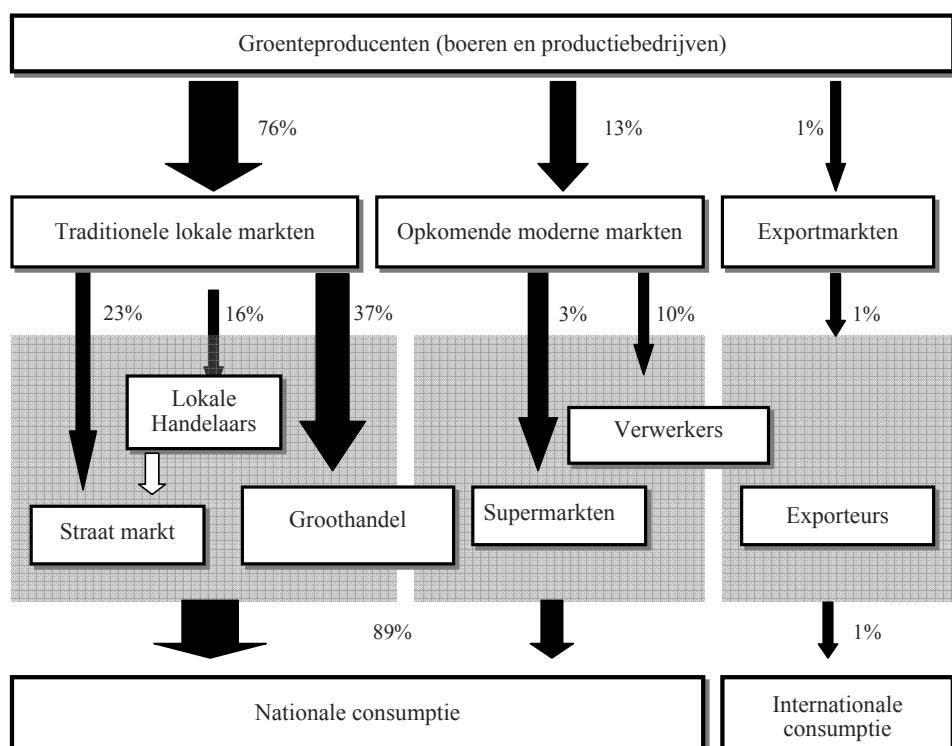
We hebben verschillende theoretische stromingen gebruikt (ketenmanagement, sociaal kapitaal en transactiekosten) en deze geïntegreerd in ons onderzoeksmodel, om hiermee de toeleveringsketens van groente in China te analyseren (zie Figuur 1). De data zijn verzameld op basis van gevalstudies en een enquête. Om de onderzoeksfrage te beantwoorden zijn de verzamelde kwantitatieve gegevens geanalyseerd met *structural equation modeling*: dit is een statistische techniek om de causaliteit tussen onderzoeksvariabelen te testen. De primaire gegevensverzameling richtte zich op twee sleutelgroepen in de toeleveringsketens van groente in de Jiangsu provincie, namelijk 167 producenten (boeren) en 84 kopers (verwerkers van groente, exportbedrijven en supermarkten). De enquête is uitgevoerd tussen januari 2004 en oktober 2005. De volgende drie koper-verkoper relaties zijn gevonden: twee relaties stroomafwaarts in de keten (producenten met hun kopers en deze kopers met hun klanten) en één relatie stroomopwaarts in de keten (kopers met hun toeleveranciers).



Figuur 1. Conceptueel onderzoeksmodel.

## Productie en verkoop van groente in China

Een achtergrondstudie naar de Chinese groentesector laat zien dat in China en in het bijzonder in de Jiangsu provincie veel kleine producenten betrokken zijn bij de productie en verkoop van groente en dat het organisatieniveau van de activiteiten zeer beperkt is. Alleen een klein aantal georganiseerde boeren en verwerkers blijkt in staat te zijn om groente te leveren aan hoogwaardige markten, zoals supermarkten en de internationale handel. Op dit moment is er nog een duidelijke voorkeur voor traditionele afzetmarkten, zoals de straat markt ("wet market") en de groothandel. Meer dan tweederde van de groenteproductie in de Jiangsu provincie wordt afgezet op deze markten. Slechts 1% van de groenteproductie wordt afgezet op de internationale markt en minder dan 3% wordt verkocht aan supermarkten, terwijl 10% verloren gaat in de keten (zie Figuur 2). Recente ontwikkelingen laten een verandering zien naar kortere toeleveringsketens. Verwerkers verkopen in toenemende mate rechtstreeks aan supermarkten en op de internationale markt zonder daarbij gebruik te maken van de



→ De pijlen geven de richting van de productstromen aan. De nummers geven het aandeel van de totale hoeveelheid groente, die via verschillende kanalen wordt afgezet

Figuur 2. Distributienetwerken van groente in de Jiangsu provincie (China).

tussenhandel. Tegelijkertijd proberen de verwerkers, exportbedrijven en supermarkten steeds vaker rechtstreeks te kopen bij de producenten van groente (individuele boeren of gespecialiseerde productielocaties) zonder daarbij gebruik te maken van de tussenhandel.

## Conclusies en discussie

Het onderzoek heeft aangetoond dat *guanxi* netwerken een significante directe en indirecte invloed hebben op de koper-verkoper relatie (met betrekking tot vertrouwen tussen de koper en verkoper, transactiespecifieke investeringen en contracten). Zowel de kopers als verkopers van groente geven aan dat *guanxi* netwerken positief bijdragen aan het delen van informatie, verkrijgen van technische en financiële ondersteuning en het uitvoeren van transacties. Het is interessant daarbij op te merken dat de positieve effecten van *guanxi* netwerken sterker aanwezig waren in relaties met partijen stroomafwaarts in de keten in vergelijking met relaties met partners stroomopwaarts in de keten, omdat kopers en verkopers hun *guanxi* op een andere manier aanwenden voor hun activiteiten. De kleine groenteproducenten (boeren) gebruiken hun *guanxi* netwerken voor het vinden van nieuwe kopers en voor het verkrijgen van toegang tot nieuwe markten. Verwerkers en exporteurs vertrouwen op hun *guanxi* netwerken om hun bedrijfsactiviteiten uit te breiden en voor het onderhouden van langdurige relaties. Alle ketenactoren maken echter minder gebruik van *guanxi* in relaties met partners stroomopwaarts in de keten, omdat het kopen van groente op "kopers"markten met weinig risico gepaard gaat. Voorts is vastgesteld dat *guanxi* net zo belangrijk is voor traditionele afzetmarkten (zoals de straat markt en de groothandel), als voor de moderne hoogwaardige supermarkten en de internationale handel. De resultaten van de gevalstudies en de enquête zijn in lijn met bestaande management literatuur en geven aan dat *guanxi* netwerken de bedrijfsmogelijkheden verrijken en de koper-verkoper relaties op de internationale markt versterken. Deze laatste conclusie kan begrepen worden uit het feit dat verwerkers en exporteurs met internationale contacten (*guanxi*) eerder geneigd zullen zijn zich te richten op afzetmogelijkheden op de internationale markt dan wanneer dergelijke contacten niet aanwezig zouden zijn.

Formele en informele contracten dragen beide bij aan een goede prestatie in de groentesector in de Jiangsu provincie. Formele contracten dragen positief bij aan de marktprestatie doordat vaker voldaan wordt aan de leveringseisen: contracten geven een beter inzicht in deze leveringseisen. Informele persoonlijke relaties, die voortkomen uit *guanxi*, zijn belangrijk, omdat ze de transactiekosten verlagen en de transacties zelf op een efficiënte manier beschermen. Het onderzoek heeft aangetoond dat complementaire effecten kunnen optreden tussen relationele (*guanxi*) en formele contracten. Dit impliceert dat *guanxi* een belangrijke rol zal blijven spelen voor Chinese bedrijven en dat het ook in de toekomst zal blijven bestaan in aanvulling op formele systemen. De combinatie van formele en informele contracten lijkt daarom de beste manier waarop de toeleveringsketen van groente kan worden georganiseerd in China.

We hebben ook geconstateerd dat integratie van de koper-verkoper relaties positief bijdraagt aan de marktprestatie. Vertrouwen tussen de koper en verkoper alsmede contracten zijn de

belangrijkste factoren die de marktprestatie van zowel kopers als verkopers beïnvloeden, omdat ze bijdragen aan het voldoen aan de leveringseisen. Als belangrijkste prestatiekenmerk in relaties met partners stroomafwaarts in de keten werd tevredenheid over de kwaliteit/prijs verhouding aangegeven, terwijl de prijstevredenheid het belangrijkste is in relaties met partners stroomopwaarts in de keten. Kwaliteit is de sleutel, die toegang geeft tot internationale afzetmarkten. Verder is het belangrijk voor het bereiken van een goede prestatie dat de kosten voor bemiddeling in de koper-verkoper relaties acceptabel zijn.

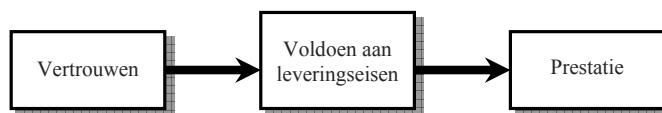
### **Verschillende wegen die leiden tot marktprestatie**

De analyse modellen geven aan dat kopers en verkopers verschillende paden volgen, die leiden tot marktprestatie (zie Figuur 3 en 4). Zowel de kleine producenten, verwerkers en de exporteurs/supermarkten hechten grote waarde aan *guanxi* netwerken en relationele contracten voor het veiligstellen van de marktprestatie in relaties met partners stroomafwaarts in de keten (zie Figuur 3).

Producenten van groente gebruiken *guanxi* netwerken voor het onderhouden van goede contacten met kopers, die ze vertrouwen. Het is interessant op te merken, dat ook managers in de verwerkende en exporterende bedrijven vertrouwen op *guanxi* netwerken om toegang te verkrijgen tot hoogwaardige supermarkten en de internationale markt, alsmede om hun zakelijke relaties te onderhouden. Efficiëntie, kwaliteit/prijs tevredenheid en uiteindelijk ook winstgevendheid zal verbeteren als ze erin slagen om te voldoen aan de leveringseisen van hun klanten. Het voldoen aan de leveringseisen zal verder verbeterd kunnen worden door bona fide koper-verkoper relaties en ondersteuning door *guanxi* netwerken. Tenslotte, vertrouwen in de



Figuur 3. Pad dat gevuld wordt voor het bereiken van prestatie in relaties met partijen stroomafwaarts in de keten.



Figuur 4. Pad dat gevuld wordt voor het bereiken van prestatie in relaties met partijen stroomopwaarts in de keten.

koper-verkoper relaties verbeterd indirect de mate waarin voldaan wordt aan leveringseisen via de intermediaire variabele, contractuele voorzieningen (zie Figuur 3).

In tegenstelling tot voorgaande, is een andere pad vastgesteld voor kopers van groente (verwerkers, exporteurs en supermarkten) in relaties met partijen stroomopwaarts in de keten (zie Figuur 4).

Kopers van groente zijn in staat visueel te inspecteren wat ze kopen tijdens *face-to-face* contacten op de markt. Individuele kopers zullen weinig problemen hebben met het verkrijgen van de juiste groente en nemen een sterke onderhandelingspositie in op een markt, die gedomineerd wordt door kopers. Voor hen is het blijkbaar niet noodzakelijk om sociale netwerken en *guanxi* te gebruiken. Niettemin is het delen van informatie met partners, die te vertrouwen zijn, een belangrijke manier om de mate waarin voldaan wordt aan de leveringseisen te verbeteren, alsmede de uiteindelijke marktprestatie. Hierbij spelen *guanxi* netwerken en formele contracten een beperkte rol.

Het onderzoek heeft, voortbouwend op de transactiekosten theorie, aangetoond dat het belangrijk is rekening te houden met de interactie tussen transactie specifieke investeringen, contracten en vertrouwen. Bovendien is in lijn met de sociaal kapitaal theorie aangetoond, dat bedrijfsnetwerken kunnen bijdragen aan vertrouwen in zakelijke relaties. Voorts is empirisch vastgesteld dat ondersteuning vanuit het bedrijfsnetwerk in belangrijke mate kan bijdragen aan waarborging van investeringen en samenwerking. Het onderzoek heeft ook laten zien dat relationele (*guanxi*) en formele contractuele overeenkomsten in complementaire zin bijdragen aan de marktprestatie. Dat neemt echter niet weg dat typische ketenmanagement eisen, zoals waarborging van kwaliteit en voldoen aan leveringseisen, ook een essentiële factor vormen in het verklaren van koper-verkoper relaties in toeleveringsketens van groente in China.

## Managementaanbevelingen

De managementaanbevelingen kunnen het beste begrepen worden vanuit een perspectief waarin langdurige en geïntegreerde koper-verkoper relaties een steeds belangrijkere rol spelen, alsmede het gebruik van persoonlijke contacten in zakelijke relaties. *Guanxi* netwerken zijn vooral belangrijk voor producenten van groente, verwerkers en exporteurs/supermarkten in hun relaties met andere partijen stroomafwaarts in de keten. Deze moeten zich echter ook realiseren dat het ontwikkelingen en onderhouden van *guanxi* netwerken geld kost. Daarbij moeten ze voorkomen teveel afhankelijk te worden van een overdaad aan *guanxi* relaties. De gevalstudie en de interviews tijdens het veldwerk toonden aan dat coöperatieve boerenorganisaties en andere belangenorganisaties kunnen fungeren als een intermediaire schakel om het probleem van kleinschalige productie versus de behoefte om te leveren aan een moderne markt op te lossen. Verder kunnen deze organisaties de implementatie van hoogwaardige kwaliteitsstandaarden door boeren stimuleren. Op die manier kunnen ze een sleutelrol spelen in het proces om boeren te helpen hun afzet aan supermarkten en op de

internationale markt te vergroten. De ontwikkeling van dergelijke organisaties zou daarom gestimuleerd moeten worden.

Ondernemerschap is als een veldslag: als je geen successen behaalt, ben je de verliezer. Door op de juiste manier *guanxi* aan te wenden, kan het een waardevolle bijdrage leveren aan het behalen van de bedrijfsdoelstellingen. Of, zoals de *Sun Tzu* zei in *The Art of War*: ‘*Know yourself, know your enemy, and you can fight a hundred battles wit hno danger of defeat*’.



## About the author

Hualiang Lu was born on October 9<sup>th</sup>, 1972 in Suzhou, Jiangsu Province, P.R. China. In 1996, he obtained a B.Sc. degree from Nanjing Agricultural University in agricultural economics. From 1996 to 2001, he worked as a government official on issues related to agricultural production and rural development in the Agriculture Department in Jiangsu Province. He obtained his M.Sc. degree at Wageningen University with a specialisation in Agricultural Economics and Management in January 2003. Thereafter, he was appointed as a Ph.D. researcher at the Management Studies Group of Wageningen University. The Ph.D. research was conducted within the context of an integrated project titled 'Globalisation, Food Quality and Sustainable International Agri-Business Chains: Chain Integration in Fish, Vegetables and Tropical Fruit in Kenya, China and Costa Rica' (WOTRO Multidisciplinary Programme Grant). His Ph.D. research was largely based on the survey of major participants in vegetable supply chains in Jiangsu Province. His work had been presented at various international conferences and contributed to book chapters and a number of national and international journals. His research interests are in the area of (inter)national agri-food chains, channel governance, quality and safety management for perishable products in the context of small-scale producers in transition economies.



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5. **Hualiang Lu**, 2003. Tomato marketing supply chain choice, efficiency and transaction costs analysis: A case study in Nanjing City, Jiangsu Province, P. R. China. *M.Sc. thesis*, Wageningen University. Supervisors: Dr. Erno Kuiper, Prof. dr. Ruerd Ruben.
6. Shuyi Feng and **Hualiang Lu**, 2001. Study on farmland institution in China, *Journal of Management & Administration on Rural Co-operative Economy*, No.1. (in Chinese).

## Conference presentations

1. **Hualiang Lu**, Jacques Trienekens and Onno Omta, 2007. Does traditional *guanxi* matter for smallholders in modern markets? A structural equation modelling. Paper will be presented at 17th International Food and Agribusiness Management Association (IAMA) Conference on 'Food Culture: Tradition, Innovation and Trust, A Positive Force for Modern Agribusiness'. June 23rd -26th 2007, Parma, Italy.
2. **Hualiang Lu**, 2006. A two-stage value chain model for vegetable marketing chain efficiency evaluation: A transaction cost approach. Paper presented at the 26th International Association of Agricultural Economists (IAAE) Conference on 'Contributions of Agricultural Economics to Critical Policy Issues'. August 12th -18th, Queensland, Australia.
3. **Hualiang Lu**, Jacques Trienekens and Onno Omta, 2006. The role of *guanxi* networks in vegetable supply chains: Empirical evidence from Jiangsu Province, P.R. China. Paper presented at 98th EAAE Seminar on 'Marketing Dynamics within the Global Trading System: New Perspectives'. June 29th -July 2nd, Chania, Crete, Greece.

4. Ruerd Ruben, **Hualiang Lu** and Erno Kuiper, 2003. Marketing chains, transaction costs and quality performance: Efficiency and trust within tomato supply chains in Nanjing City. Paper presented in CAAS-IFPRI Conference on 'The Dragon and The Elephant: Agricultural and Rural Reforms in China and India', November 10th -11th, Beijing, P.R. China.

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# Complete training and supervision plan

Hualiang Lu

Ph.D. Candidate, Mansholt Graduate School of Social Sciences



Description	Institute / Department	Year	Credits*
<b>Courses:</b>			
Research Methodology: Designing and Conducting a Ph.D. Research Project	Mansholt Graduate School	2003	2
Techniques for Writing and Presenting a Scientific Paper	Mansholt Graduate School	2003	1
Mansholt Introduction Course	Mansholt Graduate School	2003	1
Advanced Econometrics	Wageningen University	2002	3
Farm Household Economics	Wageningen University	2002	3
Supply Chain Management	Wageningen University	2003	4
Innovations in Marketing Decision Making	Wageningen University	2003	4
Summer School on Efficiency and Productivity Analysis	Mansholt Graduate School	2003	2
Food Quality and Risk Analysis	Mansholt Graduate School	2003	1
Supply Chain Economics	Mansholt Graduate School	2004	2
Ph.D. Seminar on 'Governance for Quality in Tropical Food Chains'	Mansholt Graduate School	2006	0.5
<b>Presentations at conferences and seminars:</b>			
Mansholt Multidisciplinary Seminar	Mansholt Graduate School	2006	1
International Seminar on Economic Transition and Sustainable Agricultural Development in East Asia	Nanjing Agricultural University and Wageningen University	2003	2
6th International Conference on Management in Agri-Food Chains and Networks	Management Studies Group	2006	
98th EAAE Seminar on Marketing Dynamics within the Global Trading Systems: New Perspectives	European Association of Agricultural Economists	2006	
26th Conference of the IAAE: Agricultural Economics: Contributions of Agricultural Economics to Critical Policy Issues	International Association of Agricultural Economists (IAAE)	2006	
9th PREBEM Conference on Back to Business: Creating and Translating Scientific Knowledge	Netherlands Organisation for Research in Business Economics & Management (NOBEM)	2006	
<b>Total (min. 20 credits)</b>			<b>26.5</b>

\*: One credit on average is equivalent to 40 hours of course work.

**This study is supported by:**

The Netherlands Foundation for the Advancement of Tropical Research (WOTRO), grant file number W01.65.2001.010.

**Additional support is provided by:**

Management Studies Group, Wageningen University and College of Economics and Management, Nanjing Agricultural University

Using social, organisational and economic theories, this book develops an integrated research framework to demonstrate the effects of Chinese traditional guanxi networks on modern business relationships and market performance. It also compares the effects of guanxi networks between upstream and downstream partnerships and between traditional and high-value market outlets.

It is recognised that quality and safety issues are the major constraints for Chinese vegetables entering into international markets. Primary producers face several bottlenecks such as small production scales, lack of market information and low negotiation power which leads to their exclusion by high-value market outlets such as supermarkets and international markets. Processing and exporting companies, on the other hand, experience instable delivery and inconsistent quality supply. As a result, they remain low-cost exporters in a low-quality segment of international markets. Different solutions for small-scale vegetable farmers, processing companies, exporting companies, and supermarkets in optimising their business performance are also covered.

This book is of interest to professionals and practitioners involved in the design, management and assessment of national and international supply chains for perishable products in particular in transition economies.

ISBN: 978-90-8504-665-3

ISBN: 978-90-8686-038-8